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August 1999

National Potato Germplasm Evaluation and Enhancement Report, 1998

Sixty-Ninth Annual Report
by Cooperators

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August 1999

National Potato Germplasm Evaluation and Enhancement Report, 1998

Sixty-Ninth Annual Report
by Cooperators

Edited by Kathleen G. Haynes

Vegetable Laboratory
Beltsville Agricultural Research Center
Agricultural Research Service
U.S. Department of Agriculture
Beltsville, MD 20705

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United States Department of Agriculture, Beltsville Agricultural Research Center, Beltsville, Maryland, and Presque Isle, Maine

K.G. Haynes, K. DeLong, D. Fleck, K. Frazier, M. Bragg, B. Adams, and C. Lagasse

Objectives: The USDA potato breeding program at Beltsville has four main objectives: (1) to develop improved pest-resistant germplasm and varieties; (2) to develop improved germplasm and varieties for processing; (3) to enhance germplasm for specific characteristics relating to pest resistance, yield, environmental stress, human nutrition and consumer acceptance; and, (4) to develop statistical genetic models for some of the new breeding strategies.

Breeding: Hybridizations in the greenhouse at BARC in early 1998 were made among round, white-skinned tetraploid *S. tuberosum* selections and varieties with either processing or fresh market potential and resistance to late blight, early blight, or bacterial wilt; between *S. tuberosum* selections and *S. tuberosum*-*S. gourlayi* hybrids for leafroll resistance; and between *S. tuberosum* selections and *S. tuberosum* x *S. phureja*-*S. stenotomum* hybrids with high specific gravity. These resulted in 619 successful crosses. Hybridizations were made among russet-skinned *S. tuberosum* selections and varieties, resulting in 44 successful crosses. Hybridizations were made among red-skinned and/or yellow-fleshed selections and varieties of *S. tuberosum* and *S. tuberosum* x *S. phureja*-*S. stenotomum* hybrids, resulting in 96 successful crosses. Bulk pollinations were made among the 72 most late blight resistant *S. phureja*-*S. stenotomum* selections, and controlled crosses were also made between very resistant and very susceptible selections, resulting in 137 successful crosses. In addition, crosses were made between *S. phureja*-*S. stenotomum* and *S. tuberosum*-*S. tarijense* hybrids for cold chipping ability, resulting in 48 successful crosses.

Yield and Processing Evaluations: Yield trials for round whites (BARC Tables 1-5), specialty market types (BARC Tables 6-7), and russets (BARC Table 8) were conducted at Echo Lake. These were planted in a randomized complete block design with four replications of 25 hills on May 13, 1998. Plants were spaced 9 inches within the row for all trials except the russet trial, in which plants were spaced 12 inches within the row. After harvest, tubers from each plot were graded, specific gravity was determined by the

weight in air and weight in water method, and the ten largest tubers from each plot were cut to determine the presence of hollow heart. Tuber samples were stored at 40°F, 45°F, and 50°F. Tubers were processed out of 40°F, 45°F, and 50°F, and following a three week reconditioning period of 70°F from 40°F storage during January and February for the round white and russet trials, with the exception of the first round white trial which was inadvertently processed after only 13 days of reconditioning in January. Selections in the specialty market trial were processed out of 50°F on December 7, 1998. For each combination of temperature and processing date, five tubers from each plot were processed (20 samples per clone).

Tuber samples from all yield trials except the russets were processed into potato chips by taking 1/16-inch slices from the cross section of each tuber. Slices were rinsed in water and placed on paper towels to remove excess moisture. Chips were then fried at 340°F in Primex vegetable shortening until bubbling ceased.

Among the most advanced round, white-skinned selections in the program (BARC Table 1), B0178-34, B0564-8, B0564-9, B0766-3 and B1240-1 show promise for the chipping industry. With the exception of B1240-1, which chipped satisfactorily only out of 50°F storage in January, all of these chipped satisfactorily out of 45°F storage in February. The tuber size distribution of B0564-8 and B0564-9 was split with approximately half of the distribution smaller than 2.25 inches and half larger than 2.25 inches. The tuber distribution of B0766-3 and B1240-1 was split with approximately 68% larger than 2.25 inches and 32% smaller than 2.25 inches. Atlantic had the highest specific gravity and the greatest incidence of hollow heart.

Among the newer round, white-skinned selections in the program (BARC Tables 2-5), B1414-6, B1415-7, B1429A-3, B1440-18, B1591-1, B1598-4, B1624-22 and B1625-8 chipped well, but were either significantly lower yielding than Atlantic, or had significantly lower specific gravity than Atlantic, or both.

Among the specialty market selections in the program (BARC Tables 6-7), B0811-4, B1102-3, B1145-2, B1491-5 and B1492-12 show promise for the red-skin creamer market with more than 75% of the tubers less than 2.25 inches. Tubers of B1176-50

were particularly attractive, but this selection has pink-skin. Three of the red-skinned selections had high specific gravity and chipped out of 50°F storage in December: B0811-4, B0984-1, and B1763-2. These may have some potential as roasters.

Tuber samples from the russet yield trial were processed into french fries. A 3/8- inch diameter plug was cut from the cross section of each tuber, rinsed, dried, and fried at 365°F for five minutes.

Among the russet selections in the program (BARC Table 8), B9922-11 is still the best russet in our tests. The marketable yield of B9922-11 exceeded Russet Burbank this year by 110 cwt/A; the specific gravity was higher, and the fry color was lighter than Russet Burbank. It also produced larger tubers than Russet Burbank and the russetting of the skin was much more attractive than Russet Burbank. This selection is being named AMEY and will be released in early 1999. Tubers of Amey and B1463-1 were the most attractive among the russets this year. B1463-1 has oblong-long tubers that processed well out of storage into February, however, short dormancy may be a problem for long term storage.

BARC Table 1. Yield, tuber size distribution, and quality characteristics of round whites harvested 130 days after planting at Echo Lake in 1998.

Pedigree	Tuber Size Distribution									
	% Stand ¹	Mkt cwt/A	% Mkt	<1 7/8"	1 7/8 - 2 1/4"	2 1/4 - 3 1/4"	3 1/4 - 4"	>4"	SG ²	HH ³
Atlantic	100	351	92	7.7	39.9	42.8	9.0	0.6	96	4
B0178-34	100	300	90	9.8	33.5	50.6	6.1	0.0	95	1
B0564-8	100	307	90	9.5	41.5	45.6	3.4	0.0	91	1
B0564-9	100	294	87	8.8	33.0	46.9	6.7	4.6	88	2
B0766-3	100	305	91	6.5	23.7	53.0	14.7	2.1	84	2
B1065-51	100	297	95	5.5	28.5	58.7	7.3	0.0	84	0
B1066-73	100	287	92	7.7	29.3	50.0	13.1	0.0	85	3
B1083-51	100	259	87	13.1	50.5	31.4	4.9	0.0	92	0
B1240-1	100	334	93	6.6	25.8	57.6	10.1	0.0	86	0
B1248-5	100	205	73	27.4	49.7	22.2	0.7	0.0	88	0
Superior	100	250	87	13.2	51.4	33.6	1.9	0.0	88	1
LSD (0.05)		42							05	

¹ Percent stand on June 30, 1998

² 1.0 omitted

³ Number of tubers with hollow heart out of 40

BARC Table 1. Continued.

Temperature Date	50°F 1/4	45°F 1/8	40°F 1/7	40°-70°F 1/13	50°F 2/1	45°F 2/1	40°F 2/2	40°-70°F 2/9
Pedigree	Chip ⁴	Spt ⁵	Chip	Spt	Chip	Spt	Chip	Spt
Atlantic								
B0178-34	5.5	S	5.1	S	10.0	0	7.9	S
B0564-8	5.8	S	6.1	M	8.7	0	8.2	S
B0564-9	5.8	S	5.5	S	9.5	0	8.5	S
B0766-3	6.1	S	5.8	S	9.7	0	9.1	S
B1065-51	5.5	S	5.1	S	9.3	0	7.2	M
B1066-73	8.2	S	8.5	M	9.8	0	8.8	S
B1083-51	8.2	S	8.0	S	9.8	0	10.0	S
B1240-1	6.8	S	7.2	0	9.8	0	8.4	S
B1248-5	7.0	S	7.5	0	10.0	0	9.2	S
Superior	7.3	M	7.9	M	9.7	S	9.4	S
	6.4	L	6.6	L	9.7	0	9.1	S

⁴ Chips 1-7 = satisfactory⁵ Sprout

0: no sprouts

S: <0.5"

M: 0.5" - 1.5"

L: 1.5" - 2.5"

VL: >2.5"

⁶ Processed after only 13 days of reconditioning at 70°F

BARC Table 2. Yield, tuber size distribution, and quality characteristics of round whites harvested 130 days after planting at Echo Lake in 1998.

Pedigree	Tuber Size Distribution									
	% Stand ¹	Mkt cwt/A	% Mkt	<1 7/8"	1 7/8 - 2 1/4"	2 1/4 - 3 1/4"	3 1/4 - 4"	>4"	SG ²	HH ³
Atlantic	100	340	91	9.2	38.1	48.3	4.4	0.0	98	2
B1414-6	82	274	89	3.5	13.9	49.5	25.4	7.8	81	1
B1415-7	95	287	93	3.5	18.4	60.3	14.4	3.3	85	3
B1429A-3	100	311	89	11.4	42.2	40.8	5.6	0.0	88	0
B1440-18	100	284	92	7.9	45.9	43.4	2.8	0.0	76	3
B1450-10	100	191	59	41.1	44.7	12.8	1.4	0.0	83	0
Coastal Chip	100	286	84	16.0	51.1	30.9	2.0	0.0	92	0
LSD (0.05)		41								04

BARC Table 2. Continued.

Pedigree	50°F 1/4		45°F 1/7		40°F 1/7		40°-70°F 1/13		50°F 2/1		45°F 2/1		40°F 2/2		40°-70°F 2/9	
Date	Chip ⁴	Spt ⁵	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt
Atlantic	5.8	S	5.1	S	9.5	0	7.8	M	6.2	VL	7.2	VL	9.8	S	8.1	M
B1414-6	5.9	S	6.0	0	9.8	0	9.2	S	6.1	S	7.2	S	10.0	S	8.9	S
B1415-7	6.8	0	6.0	0	10.0	0	7.9	S	6.0	S	7.2	S	8.7	0	8.2	S
B1429A-3	6.1	S	6.6	S	10.0	0	8.2	S	6.9	M	7.3	L	10.0	0	7.8	S
B1440-18	5.5	S	5.0	S	9.0	0	8.1	S	6.2	S	6.8	S	9.0	S	8.0	S
B1450-10	6.9	M	7.4	M	10.0	S	9.8	S	7.7	M	7.5	L	10.0	S	9.6	S
Coastal Chip	4.8	L	4.8	L	9.3	0	7.8	S	5.3	VL	6.3	VL	9.0	S	7.9	M

¹⁻⁵ See BARC Table 1

BARC Table 3. Yield, tuber size distribution, and quality characteristics of round whites harvested 130 days after planting at Echo Lake in 1998.

Pedigree	% Stand ¹	Mkt cwt/A	Tuber Size Distribution							SG ²	HH ³
			% Mkt	<1 7/8"	1 7/8 - 2 1/4"	2 1/4 - 3 1/4"	3 1/4 - 4"	>4"			
Atlantic	100	328	89	5.0	26.9	54.7	7.9	5.5	100	7	
B1452-21	100	152	77	22.8	39.2	34.4	3.6	0.0	62	1	
B1463-12	100	201	66	33.6	49.7	16.7	0.0	0.0	82	0	
Snowden	100	357	88	11.5	47.3	39.5	1.7	0.0	97	0	
LSD (0.05)	-	76								05	

BARC Table 3. Continued.

Pedigree	50°F 1/4		45°F 1/8		40°F 1/7		40°-70°F 1/13		50°F 2/1		45°F 2/1		40°F 2/2		40°-70°F 2/9	
Date	Chip ⁴	Spt ⁵	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt
Atlantic	6.5	S	5.6	S	9.5	0	8.0	M	6.3	VL	7.0	VL	9.8	S	8.0	M
B1452-21	8.5	0	8.3	S	10.0	0	10.0	S	7.9	S	8.8	S	10.0	S	10.0	S
B1463-12	7.3	M	7.2	S	9.8	0	9.7	S	7.6	VL	7.8	VL	10.0	S	9.0	M
Snowden	5.3	S	4.8	S	9.3	0	5.3	M	5.8	L	6.3	L	8.1	S	7.0	M

¹⁻⁵ See BARC Table 1

BARC Table 4. Yield, tuber size distribution, and quality characteristics of round whites harvested 130 days after planting at Echo Lake in 1998.

Pedigree	Tuber Size Distribution									
	% Stand ¹	Mkt cwt/A	% Mkt	<1 7/8"	1 7/8 - 2 1/4"	2 1/4 - 3 1/4"	3 1/4 - 4"	>4"	SG ²	HH ³
Atlantic	100	376	91	8.0	31.7	51.5	7.9	1.0	98	0
B1591-1	100	275	88	12.3	44.4	40.0	3.3	0.0	96	0
B1598-4	100	310	90	10.2	43.5	45.3	0.9	0.0	83	0
B1624-22	100	339	89	9.9	35.4	47.3	6.1	1.2	80	0
B1625-8	98	270	85	15.2	46.3	34.8	3.7	0.0	94	0
Wauseon	100	379	91	6.8	27.3	53.7	9.9	2.3	82	0
LSD (0.05)		50								04

BARC Table 4. Continued.

Pedigree	50°F 1/4		45°F 1/8		40°F 1/7		40°-70°F 1/13		50°F 2/1		45°F 2/1		40°F 2/2		40°-70°F 2/9	
	Chip ⁴	Spt ⁵	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt	Chip	Spt
Atlantic	5.7	S	5.4	S	9.3	0	8.0	M	5.5	L	6.4	VL	9.0	S	8.2	M
B1591-1	6.4	S	5.3	M	9.5	0	8.7	S	6.6	L	6.0	VL	9.3	S	9.2	M
B1598-4	5.0	S	4.3	S	9.5	0	8.3	S	5.8	S	5.5	M	9.2	S	8.0	M
B1624-22	6.0	S	5.3	S	9.3	0	7.3	S	5.5	M	6.3	M	9.3	S	7.8	S
B1625-8	5.9	M	5.8	M	9.4	0	7.6	S	5.6	VL	5.5	VL	9.2	S	8.0	M
Wauseon	7.3	S	7.5	S	10.0	0	9.9	S	7.9	M	8.4	M	10.0	S	9.5	S

¹⁻⁵ See BARC Table 1

BARC Table 5. Yield, tuber size distribution, and quality characteristics of round whites harvested 131 days after planting at Echo Lake in 1998.

Pedigree	Tuber Size Distribution									
	% Stand ¹	Mkt cwt/A	% Mkt	<1 7/8"	1 7/8 - 2 1/4"	2 1/4 - 3 1/4"	3 1/4 - 4"	>4"	SG ²	HH ³
Atlantic	100	355	93	6.8	37.6	49.5	6.2	0.0	98	2
B1136-29	100	272	89	11.0	41.1	45.3	2.6	0.0	83	0
B1711-8	100	297	89	9.9	29.9	50.2	9.1	0.9	78	3
B1712-18	99	268	91	8.7	35.1	50.5	5.7	0.0	80	0
B1714-2	100	273	84	15.9	42.4	40.4	1.3	0.0	90	0
Pungo	100	330	90	9.8	38.2	43.6	8.4	0.0	85	0
LSD (0.05)		42								07

BARC Table 5. Continued.

Temperature Date	50°F 1/4	45°F 1/8	40°F 1/7	40°-70°F 1/13	50°F 2/1	45°F 2/1	40°F 2/2	40°-70°F 2/9
Pedigree	Chip ⁴	Spt ⁵	Chip	Spt	Chip	Spt	Chip	Spt
Atlantic	6.1	S	6.0	S	9.6	0	7.4	S
B1136-29	6.1	S	6.0	S	10.0	0	9.0	S
B1711-8	8.0	S	7.9	S	9.8	0	9.1	S
B1712-18	6.0	M	6.2	M	9.1	0	8.5	S
B1714-2	7.9	M	7.8	L	10.0	0	8.8	S
Pungo	8.3	M	8.0	M	10.0	0	9.0	S
					6.5	L	6.4	VL
					7.0	M	7.1	M
					7.8	M	7.8	M
					5.9	VL	6.7	VL
					8.2	VL	8.1	VL
					7.8	VL	8.4	VL
							9.8	S
							9.8	S
							9.8	S
							9.2	M
							10.0	S
							10.0	S
							8.1	M
							8.8	M

¹⁻⁵ See BARC Table 1

BARC Table 6. Yield, tuber size distribution, and quality characteristics of specialty market potatoes harvested 131 days after planting at Echo Lake in 1998.

Tuber Size Distribution													
Pedigree	% Stand ¹	Mkt cwt/A	% Mkt	<1 7/8"	1 7/8 - 2 1/4"	2 1/4 - 3 1/4"	3 1/4 - 4"	>4"	SG ²	HH ³	Chip ⁴	Spt ⁵	Comments
B0811-4	97	174	73	26.6	50.7	22.6	0.0	0.0	92	0	6.8	0	red skin, yf
B0852-7	100	270	85	14.1	39.0	41.1	4.8	1.0	76	2	8.2	0	purple skin
B0967-11	97	363	88	5.7	25.1	50.0	13.3	5.9	88	0	8.1	S	purple skin
B0984-1	100	345	93	5.6	21.5	59.6	12.2	1.2	89	0	6.8	0	red skin
B1102-3	100	158	59	40.9	42.7	16.4	0.0	0.0	77	0	7.5	0	red skin
B1145-2	100	214	78	22.1	56.5	20.3	1.1	0.0	82	0	6.5	0	red skin
B1425-9	100	340	88	12.0	37.8	42.9	7.2	0.0	98	0	7.2	S	yf
B1491-5	99	198	73	27.0	40.6	28.7	3.8	0.0	70	1	8.2	0	red skin, yf
B1492-12	100	230	72	28.4	57.5	14.1	0.0	0.0	83	0	7.5	0	red skin
B1493-1	99	169	61	38.5	42.7	17.5	1.3	0.0	81	0	8.1	0	red skin
Red Pontiac	100	359	91	8.9	34.7	48.3	8.0	0.0	69	0	9.5	0	red skin
Yukon Gold	100	290	91	8.8	35.3	47.3	8.7	0.0	90	0	7.9	0	yf
LSD (0.05)		53							04				

¹⁻⁵ See BARC Table 1

⁴ Processed out of 50°F December 7, 1998

BARC Table 7. Yield, tuber size distribution, and quality characteristics of specialty market potatoes harvested 113 days after planting at Echo Lake in 1998.

Pedigree	% Stand ¹	Mkt cwt/A	Tuber Size Distribution								Spt ⁵	Comments
			<1 7/8"	1 7/8 - 2 1/4"	2 1/4 - 3 1/4"	3 1/4 - 4"	>4"	SG ²	HH ³	Chip ⁴		
B1176-4	99	111	45.6	43.8	10.0	0.6	0.0	86	0	7.2	0	red skin
B1176-46	99	200	18.8	40.1	38.0	3.2	0.0	63	1	7.3	0	red skin
B1176-50	98	175	23.2	50.6	26.1	0.0	0.0	85	0	6.5	0	pink skin
B1176-7	100	126	43.4	50.1	6.5	0.0	0.0	68	0	7.5	0	red skin
B1493-3	100	168	34.0	47.8	17.1	1.1	0.0	79	0	7.6	0	red skin, yf
B1493-8	99	161	31.2	45.6	23.1	0.0	0.0	80	1	7.1	0	red skin, yf
B1495-15	94	261	6.5	36.4	49.6	4.9	2.6	88	1	8.4	0	purple skin
B1495-6	99	185	28.9	53.8	16.7	0.6	0.0	87	0	7.4	0	red skin
B1521-2	98	143	37.8	44.5	17.1	0.7	0.0	73	0	7.3	0	red skin
B1522-1	98	217	26.2	36.7	33.3	3.9	0.0	72	0	8.1	0	red skin
B1522-6	98	210	15.0	34.0	37.7	11.4	2.0	69	3	8.0	0	red skin
B1523-4	85	216	16.8	34.7	36.7	10.9	0.9	78	0	8.9	S	red skin
B1524-2	94	284	16.4	42.4	35.3	5.9	0.0	74	0	8.9	0	red skin
B1526-1	98	161	28.8	39.7	26.1	5.4	0.0	81	0	8.4	0	red skin, yf
B1529-1	96	199	18.8	39.5	38.1	3.6	0.0	78	0	7.9	S	purple skin
B1763-2	100	173	35.5	49.1	15.4	0.0	0.0	86	0	6.9	S	red skin
Red Pontiac	100	290	9.7	38.2	46.1	6.0	0.0	73	0	9.8	0	red skin
Yukon Gold	100	282	7.4	37.0	48.7	7.0	0.0	88	0	7.8	0	yf
LSD (0.05)		46						04				

¹⁻⁵ See BARC Table 1

⁴ Processed out of 50°F December 7, 1998

BARC Table 8. Yield, tuber size distribution, and quality characteristics of russets harvested 113 days after planting at Echo Lake in 1998.

Pedigree	Tuber Size Distribution									
	% Stand ¹	Mkt cwt/A	% Mkt	<2 oz	2-6 oz	6-10 oz	10-16 oz	>16 oz	SG ²	HH ³
B0835-11	100	269	89	10.7	37.7	48.6	3.0	0.0	75	1
B1004-8	100	211	77	23.4	57.6	18.4	0.6	0.0	83	0
B1409-2	100	259	87	12.9	46.2	38.7	2.2	0.0	88	0
B1452-10	100	187	80	20.3	53.3	25.6	0.7	0.0	87	2
B1452-19	100	174	71	28.6	49.3	22.1	0.0	0.0	84	0
B1452-3	100	194	83	16.6	44.0	38.7	0.7	0.0	75	0
B1463-1	100	231	89	10.5	45.7	40.2	3.5	0.0	84	1
B1730-22	100	251	84	16.1	52.4	31.5	0.0	0.0	88	0
B1730-30	100	240	84	16.1	48.9	35.0	0.0	0.0	88	0
B1730-4	100	118	49	51.0	46.3	2.6	0.0	0.0	86	0
B1739-1	100	177	83	16.1	46.4	35.7	1.0	0.8	81	0
B1746-4	100	294	88	11.2	44.9	41.5	1.3	1.0	78	1
Amey (B9922-11)	100	294	90	9.7	40.7	48.2	1.4	0.0	90	1
Coastal Russet	100	217	76	24.3	62.8	12.9	0.0	0.0	78	0
Frontier Russet	100	224	84	15.5	47.0	37.0	0.5	0.0	78	0
Krantz	99	249	90	9.3	36.2	52.1	1.7	0.7	87	0
Norgold Russet	100	230	79	21.0	52.8	23.8	2.3	0.0	75	0
Russet Burbank	100	184	70	30.4	60.1	9.6	0.0	0.0	82	0
LSD (0.05)		38							04	

^{1-3,5} See BARC Table 1

BARC Table 8. Continued.

Temperature Date	50°F 1/8	45°F 1/11	40°F 1/12	40°-70°F 1/12	50°F 2/2	45°F 2/3	40°F 2/3	40°-70°F 2/8
Pedigree	Fry ⁴	Spt ⁵	Fry	Spt	Fry	Spt	Fry	Spt
B0835-11	3.5	0	3.0	0	4.7	0	5.0	0
B1004-8	3.4	S	2.9	S	4.5	0	2.1	S
B1409-2	2.6	S	2.5	S	5.0	0	2.9	S
B1452-10	2.0	M	1.3	S	4.5	0	4.2	S
B1452-19	3.3	S	2.8	S	5.0	0	4.8	S
B1452-3	2.8	S	3.0	S	4.6	0	3.9	S
B1463-1	1.5	L	1.7	M	4.3	0	2.2	S
B1730-22	2.0	VL	1.8	L	4.6	0	3.3	S
B1730-30	2.9	M	2.5	M	4.6	0	2.5	S
B1730-4	1.3	S	1.6	S	4.5	0	3.6	S
B1739-1	1.8	0	1.8	0	4.3	0	3.8	S
B1746-4	3.7	M	3.6	M	5.0	0	5.0	S
Amey (B9922-11)	2.2	S	3.3	S	5.0	0	3.3	S
Coastal Russet	3.6	L	3.5	M	5.0	0	4.5	M
Frontier Russet	3.0	0	3.5	S	5.0	0	4.6	S
Krantz	1.5	M	1.5	M	4.6	0	3.5	S
Norgold Russet	3.4	L	3.1	L	5.0	0	4.5	M
Russet Burbank	3.2	0	2.9	0	5.0	0	4.5	S

⁴ Fry 1-3 = satisfactory

U.S. Department of Agriculture
Agriculture Research Service

Potato Genetics and Enhancement
Project—Madison, Wisconsin

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Evaluation of Parental Materials and
Enhancement Selections for Resistance to
Early Blight, Colorado Potato Beetle and Early
Dying in Field Tests

As a part of the joint National Cooperative Enhancement Project, we continued to evaluate our enhancement materials for resistance to early blight, Colorado potato beetle in unsprayed plots and for early dying in an infected plot at the UW Agricultural Research Station at Hancock, Wisconsin. These tests augment our routine evaluation for yield, chipping, specific gravity, adaptation, etc. which are done at various stages in the development of our materials. The following is a summary of our field data taken on materials tested in 1998 at Hancock.

Early Blight. This trial was intended to be for late blight, which never came this season; however, a natural heavy early blight infection occurred so we took advantage of this opportunity to evaluate this material for early blight resistance. One thousand and sixty-eight entries were tested for their reaction to natural early blight infection in the field in a large unreplicated trial. Among those tested were 72 foreign varieties, 39 foreign breeding stocks, 340 haploids, and 513 1994 enhancement hybrids. A summary of the resistance noted in these materials is listed in Table 1. Of 2,600 individuals tested, 187 or 7.2 percent showed resistance. The largest number of resistant individuals (175) were found in the 1995 enhancement hybrid families which were chosen because of potential late blight resistance. The most resistant selections were the foreign varieties Aracy, and Chaska; the bacterial wilt line BR 63.76 was the most resistant selection noted among the 1995 enhancement hybrid families, with most families having individuals in the 10-20 percent defoliation range.

Colorado Potato Beetle. One thousand and fifty

four entries were evaluated for resistance to natural populations of Colorado potato beetle. These represented materials not tested in previous years as well as some undergoing further evaluation. Included in this study were 514 1994 enhancement hybrids, 345 haploids, 63 foreign varieties and 32 foreign breeding stocks. From the 1265 individuals tested, 54 (4.3%) exhibited some resistance (Table 2). The largest number of resistant individuals were from the species bulk populations tested. This was not surprising since they were bulk populations of *S. chacoense*. Among the most resistant were the foreign varieties Kenya Baraka, Uran, and Zarewo, species/haploid Tuberosum hybrid line 1053-2R, bacterial wilt line 8-34, DH series US-W 9593.12, HET diallel line 1284-7, parent plot line Monona, and main haploid line US-W 10,614 (Chip).

Early Dying. One thousand one hundred and seven entries were tested for resistance to early dying in a field inoculated with *Verticillium* wilt. The largest groups tested were 81 foreign varieties, 70 foreign breeding stocks, 333 haploids and 512 1994 enhancement hybrids. Thirty-one selections (2.7%) exhibited resistance of the 1135 individuals tested (Table 3). The largest number of resistant selections were found among the foreign variety and foreign breeding stocks tested, with 11 each. The most resistant materials noted were Kenya Baraka and Vekaro among the foreign varieties, A 8670-7, CEX 69-1, CFL-69-1, PI 527315, and TS-9 among the foreign breeding stocks, late blight line 833B98, bacterial wilt line MS 35.9, and main haploid US-W 4056 (Merr).

During the past several years, we have been able to evaluate nearly all of our parental materials and some of our advanced enhancement selections for potential resistance to late blight, early blight, Colorado potato beetle and *Verticillium* wilt/early dying. Because these are field evaluation, there is always the confounding effects of other pests that become a part of the evaluation. For example, early blight and late blight occur together in the unsprayed late blight trials. They also attack the *Verticillium* wilt trial. In any event, the resistance to both is essential in a breeding program. Since no stem inoculum was evaluated for *Verticillium* colony forming units, the observations are uncertain as to actual resistance to early dying/*Verticillium*. These selections need to be tested more carefully for their resistance. These tests are not as definitive as one would like, but certainly are helpful in attempting to get a handle on potential resistance

among these materials. It is encouraging, since we continue to find materials exhibiting resistance to late blight, early blight, *Verticillium* wilt/early dying and Colorado potato beetle. We hope these will help to augment existing sources of resistance in our National Cooperative Enhancement Project.

Evaluation for Resistance to *Phytophthora infestans* in Mexican 2x(1EBN) Wild Potato Species

The focus of this study is on Mexican diploid 1EBN wild potato species. 1EBN species were selected because to date no known research has specifically addressed the resistance to *Phytophthora infestans* present in these Mexican species. Additionally, the diploid nature of the species will allow for a relatively straight forward evaluation of resistant genotypes as compared to working at a higher ploidy level. Two *Solanum* species were selected for this study, *Solanum cardiophyllum* subsp. *cardiophyllum* (cph) and *S. pinnatisectum* (pnt), based on PI evaluations for susceptibility and resistance, respectively. Selection was also based on flowering characteristics and the ability to cross and obtain viable seed. *S. cardiophyllum* subsp. *cardiophyllum* PIs were selected from available plants in the field during early fall 1996, at the UW Lelah Starks Potato Breeding Farm. *Solanum pinnatisectum* PIs were selected from previously screened individuals from tubers. Two PIs of *S. cardiophyllum* subsp. *cardiophyllum* (5 plants each) and seven PIs of *S. pinnatisectum* (5 plants per PI) were selected.

Detached leaf tests were chosen for the initial determination of disease reactions. This decision was based the available resources and the flexibility of being able to screen a large number of individuals in replicated trials over a short period while maintaining the screened plant. Results will later be compared to field trials and/or whole plant evaluations. All detached leaf tests have used MSU-96 (provided by Dr. K. Deahl, USDA, ARS, Beltsville, Maryland), a US-8 A2, metalaxyl-resistant isolate.

A primary concern of any resistance study is the disease resistance evaluation. Therefore, the following discussion will address the reliability of the detached leaf test used in the evaluation of

Mexican 2x(1EBN) potato species. The detached leaf tests used 150 mm petri dishes. Three layers of high absorbent paper towels are placed in the bottom of the dishes and 35 ml of sterile distilled water added. A double layer plastic mesh is placed on the paper towels, onto which is placed the detached leaf. The leaf is then sprayed once with sterile distilled water, followed by a single spray of inoculum (30,000 sporangia per ml). The petri dish is sealed with parafilm and placed in an incubator at 18 C with a twelve hour day/night cycle. Light is provided by two horizontal cool white florescent bulbs across the top and four vertical bulbs at the back of the incubator. Multiple layers of shelves are used in the incubators, approximately 1 foot apart. Infected area of the leaf was scored at 6 days using a scale of 0 to 9, odd numbers only, where 0 is no infection and 9 is 75-100% infection.

A significant problem reported with detached leaf tests is inconsistency. Therefore the following analysis was conducted to evaluate potential sources of variation. One possible source of variation is light. Two different incubators were used. Use of multiple shelves (to maximize space) meant that lower shelves received less light than higher shelves. Light readings were taken from both incubators. Analysis of variance indicated significant differences for light among positions on shelves and among shelf levels. The two incubators were not significantly different. Positional effects were tested for parental plants inoculated with *P. infestans*. No significant differences were detected for position on a shelf, shelves or incubators. Having established consistency within a single inoculation, the next step was to evaluate two separate inoculations. Analysis of variance for parental plants on two different dates was done. Significant differences were detected between plants but not between dates. Further analysis has indicated consistency for parental plants on four different inoculation dates. Scores also show consistency when grown from tubers or from cuttings.

Another aspect of resistance characterization relies on the detection of polymorphisms. Table 4 reports parental plants scored for polymorphisms. The first column indicates polymorphisms for the resistant *S. pinnatisectum* individual and the susceptible *S. cardiophyllum* PI (bulk sample) used to generate a mapping BC₁ population. At 91%, the screened clones present a uniform distribution over all twelve potato chromosomes. Additional information gained from the screen includes evidence of a fairly

significant level of polymorphism (55%) among two *S. cardiophyllum* PIs, one susceptible, one resistant. Polymorphism, however, were not observed on all chromosomes. The third column compares a single *S. pinnatisectum* PI to a bulked sample of five other *S. pinnatisectum* PIs. Although the number of bands were quite low, usually only one or two, few polymorphisms were detected. Finally, an expected high level of polymorphisms were reported between a susceptible haploid and resistant *S. pinnatisectum* PI (98%).

Evaluation of Resistance to Late Blight (*Phytophthora infestans*) between Diploid *Solanum* Wild Species and *S. tuberosum* subsp. *tuberosum* Haploids

While the majority of diploid wild potato species hybridize readily with *Solanum tuberosum* subsp. *tuberosum* haploids, some diploid species categorized as 1 EBN do not cross with tetraploid or haploid forms of *S. tuberosum* subsp. *tuberosum*. By manipulating EBN, using a second compatible pollination and embryo rescue, it is possible to overcome this barrier. Efforts to generate hybrids from crosses of Mexican diploid 2x(1EBN) species x 2x(2EBN) *S. tuberosum* haploids via embryo rescue and double pollination were conducted. After 3,077 pollinations were made during the spring and summer of 1995, 31 potential hybrids were obtained; however, they were discarded because of their *S. phureja* second pollinator characteristics. The length of time before conducting embryo rescue [20-25 days after pollination-(DAP)] was blamed for this failure. In 1996, 3,288 pollinations were made, resulting in 184 fruit. Embryo rescue was performed between 14 and 20 DAP and resulted in 3,867 embryos of which 530 developed into seedlings.

In January of 1997, a unique hybrid was discovered in this population. This diploid hybrid arose from a cross between the haploid US-W 13,089 (Sebago) x *S. pinnatisectum* (PI 275233). The hybrid was hypoploid (22 chromosomes). Its hybridity was confirmed through morphology, chromosome number and RAPD analysis. Its resistance to putative late blight was tested in 1997 in an unsprayed replicated experiment at the UW Agricultural Research Station at Hancock, WI, where the

results indicated a high level of field resistance to the disease (Table 5). The hybrid exhibited a low degree of male and female fertility. From meiotic analysis it was evident that normal pairing between the two genomes occurred, although the presence of univalents was observed. These results support the view that transfer of valuable characters from *S. pinnatisectum* to *S. tuberosum* cultivars is feasible; however, aneuploidy and the presence of univalents may inhibit this effort.

Simultaneously, a second approach was conducted using 2x(2EBN) *S. berthaultii*. Since this species and *S. tuberosum* haploids have the same EBN, embryo rescue was not necessary. Thirty seven plants were obtained after 289 pollinations. These hybrids were tested for resistance to late blight in the field where high to moderate resistance plus attractive agronomic characteristics were observed (Table 5). Although it is unknown if resistant progeny can be recovered after a backcross, *S. berthaultii* may offer the possibility of producing late blight resistant advanced diploid lines in a reasonably short time.

Evaluation of Resistance to Colorado Potato Beetle (*Leptinotarsa decemlineata*) in Hybrids between *Solanum* Wild Species and *Solanum tuberosum* subsp. *tuberosum* haploids

Efforts to generate hybrids between diploid potato species resistant to Colorado potato beetle (*Leptinotarsa decemlineata*) and *Solanum tuberosum* subsp. *tuberosum* haploids were initiated during the summer of 1995 when 2,164 pollinations were conducted between 26 accessions of the diploid species *S. bukasovii*, *S. chacoense*, *S. polyadenium*, *S. raphanifolium*, *S. sparsipilum*, *S. tarijense* and 4x(4EBN) *S. tuberosum* subsp. *andigena* and *S. tuberosum* subsp. *tuberosum* haploids. Only *S. polyadenium* did not yield any fruit, but the rest of the crosses produced 831 plants representing several wild species x haploid F₁ families.

During the summer of 1997, 21 families, one backcross, nine PIs, eleven haploids, six controls and one cultivar were tested for CPB resistance in the field using a 7x7 lattice where the cultivar 'Norland' was used as a spreader. Individual plants were scored weekly for the number of egg masses, larvae, adults and percent defoliation. However, none of the variables related to the insect were helpful in describing the resistance, possibly because of the high mobility of the insect. A wide range of reactions was

observed within and between families (Table 6). *S. bukasovii*, *S. raphanifolium*, *S. sparsipilum* or their respective families displayed low resistance to the insect. Those individuals with *S. tarijense* parentage exhibited moderate resistance, but only those hybrids with *S. chacoense* showed high resistance to the insect that normally lasted until the final evaluation. Hybrids between subsp. *tuberosum* haploids and *S. tuberosum* subsp. *andigena* had considerable resistance, clearly surpassing that observed in both parents. The backcross family obtained by crossing a haploid x *S. chacoense* hybrid with the cultivar US-W 1099 had a high defoliation value suggesting loss of resistance during the backcross process. The results obtained in this work indicate that use of *S. bukasovii*, *S. raphanifolium* or *S. sparsipilum* having low levels of resistance, may be useful as well. More research is needed for the potential use of subsp. *andigena* and how to improve the levels of resistance in successive backcrosses of resistant hybrids.

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Enhancement Table 1. Summary of 1998 early blight evaluations based on percent defoliation at the UW Agricultural Research Station, Hancock, WI.

<u>Group</u>	<u># Tested*</u>	<u># Resistant</u>	<u>% Resistant</u>
Foreign Varieties	72	2	2.8
Foreign Breeding Stocks	39	7	17.9
Late Blight Differentials	17	0	0.0
Species/haploid Tuberosum hybrids	1	0	0.0
Bacterial Wilt	10	1	10.0
DH Series	14	0	0.0
HET Series	8	0	0.0
HP Series	2	0	0.0
Bulk Populations	3 (120)	1	0.8
Parent Plot	19	0	0.0
New Haploids	10	0	0.0
Peloquin Haploids	27	0	0.0
Main Haploids	303	1	0.3
1993 Enhancement Hybrids	2	0	0.0
1994 Enhancement Hybrids	513	0	0.0
<u>1995 Enhancement Hybrids Families</u>	<u>28 (1443)</u>	<u>175</u>	<u>12.1</u>
Total	1,068 (2,600)	187	7.2

* number of families (number of individuals)

Enhancement Table 2. Summary of 1998 Colorado potato beetle evaluations based on percent defoliation at the UW Agricultural Research Station, Hancock, WI.

<u>Group</u>	<u># Tested*</u>	<u># Resistant</u>	<u>% Resistant</u>
Foreign Varieties	63	8	12.7
Foreign Breeding Stocks	32	1	3.1
Late Blight Differential	13	1	7.7
Varieties x Bulk Populations	2	0	0.0
Species/haploid Tuberosum hybrids	8	2	0.3
Bacterial Wilt	13	2	15.4
DH Series	20	1	5.0
HET Series	5	0	0.0
HET Diallel	2	1	50.0
HP Series	2	0	0.0
Bulk Populations	2	32	21.1
Parent Plot	20	2	10.0
New Haploids	10	0	0.0
Peloquin Haploids	28	0	0.0
Main Haploids	307	1	0.3
Pre 1990 Enhancement Hybrids	6	0	0.0
1993 Enhancement Hybrids	1	0	0.0
1994 Enhancement Hybrids	514	1	0.2
<u>1995 Enhancement Hybrids Families</u>	<u>6</u>	<u>2</u>	<u>3.4</u>
Total	1,054 (1,265)	54	4.3

* number of families (number of individuals)

Enhancement Table 3. Summary of early dying evaluations at the UW Agricultural Research Station, Hancock, WI.

Group	# Tubers*	# Resistant	% Resistant
Foreign Varieties	81	11	13.6
Foreign Breeding Stocks	70	11	15.7
Late Blight Differential	7	1	14.3
Rowe Selections	2	0	0.0
DH Selections	1	0	0.0
Species/haploid Tuberosum hybrids	6	0	0.0
Bacterial Wilt	11	3	27.3
DH Series	17	0	0.0
HET Series	8	0	0.0
HVS Series	5	0	0.0
HET Diallel	2	1	50.0
HP Series	1	0	0.0
Parent Plot	19	0	0.0
New Haploids	10	0	0.0
Peloquin Haploids	27	0	0.0
Main Haploids	296	2	0.7
Pre-1990 Enhancement Selections	3	0	0.0
1990 Enhancement Selections	3	0	0.0
1991 Enhancement Hybrids	5	0	0.0
1992 Enhancement Hybrids	4	0	0.0
1993 Enhancement Hybrids	16	0	0.0
1994 Enhancement Hybrids	512	0	0.0
1995 Enhancement Hybrids Families	<u>1</u>	<u>2</u>	<u>6.9</u>
Total	1,107 (1,135)	31	2.7

* number of families (number of individuals)

Enhancement Table 4. Parental material scored for polymorphisms.

Polymorphisms	5JK1D ^a vs cph2 ^b		cph1 ^c vs. cph2 ^b		Bulk pnt ^d vs. pnt5 ^e		Haploid vs pnt ^f	
	EcoRI	HindIII	EcoRI	HindIII	EcoRI	HindIII	EcoRI	HindIII
Present	36	41	20	26	0	5	51	49
Absent	22	17	38	32	58	53	7	9
Totals:								
Polymorphic	53 (91%)		32 (55%)		5 (9%)		57 (98%)	
Non-polymorphic	5 (9%)		26 (45%)		53 (91%)		1 (2%)	

^a pnt individual, PI 253214

^b cph PI 347759

^c cph PI 283062

^d bulk pnt includes PIs: 184764, 186553, 190115, 275234, 347766

^e pnt PI 253214

^f pnt PI 275233

Enhancement Table 5. Summary of the 1997 late blight field test at the UW Agricultural Research Station at Hancock, WI.

Category	Parentage	% Defoliation
F ₁	US-W 13089 (Sebago) x pnt 275233	1
Species	pnt 275233	1
F ₁	MPI 62526/5 x ber 473331	23
Species	ber 473331	10
Haploid	US-W 2900	95
F ₁	US-W 2900 (Merrimack) x ber 265858	38
Species	ber 265858	8
Haploid	US-W 551	100
F ₁	US-W 551 (Chippewa) x ber 265858	70
Species	ber 265858	8
Control	Atlantic	100
Control	Ranger Russet	100
Control	Russet Burbank	100
Control	Snowden	100
Haploid	US-W 1818 (Chippewa)	100
Haploid	US-W 2685 (Chippewa)	100

Enhancement Table 6. Means analysis of defoliation ratings for four weeks of screening at the UW Agricultural Research Station at Hancock, WI.

Parentage	% Defoliation *
adg (473255)	99.6
US-W 13030 (adg PI 347773.16)	96.9
US-W 2668 (Chippewa)	94.2
MPI 62.526/5 x buk (PI 265876)	94.1
US-W 558 (Chippewa)	93.9
US-W 2850 (Wis AG 231)	93.2
US-W 73 (Merrimack)	93.0
G-65 (MPI 44.1016/10)	92.0
US-W 730 (Wis AG 231)	91.5
MPI 62.526/5 (PI 285168)	89.1
US-W 3773 (Merrimack)	89.1
US-W 3458 (Merrimack)	88.4
US-W 493 (adg PI 205623.1)	88.1
G-65 x spl (PI 473504)	82.9
US-W 13030 x rap (PI 473528)	82.9
rap (PI 473528)	81.3
US-W 2850 x spl (PI 473504)	78.6
US-W 2850 x tar (PI 414148)	78.3
US-W 730 x spl (PI 473504)	72.9
Norland	72.5
US-W 3458 x spl (PI 473504)	69.7
buk (PI 265876)	69.4
Snowden	68.2
Katahdin	66.0
W-1099	64.4
spl (PI 473504)	64.1
Russet Burbank	63.7
US-W 3773 x rap (PI 473528)	63.5
Ranger Russet	63.2
Atlantic	61.8
BC [W 1099 x (US-W 558 x chc PI 265576)]	61.5
US-W 3773 x spl (PI 473504)	61.3
US-W 493 x buk (PI 265876)	56.8
US-W 13030 x tar (PI 414148)	56.5
US-W 2850 x rap (PI 473528)	55.1
US-W 730 x rap (PI 473258)	53.4
G-65 x chc (PI 473402)	48.7
US-W 13030 x chc (PI 473405)	39.7
US-W 13030 x spl (PI 473504)	36.0
US-W 493 x adg (PI 473255)	25.6
US-W 2668 x chc (PI 133123)	25.4
US-W 493 x chc (PI 265576)	23.8
US-W 73 x adg (PI 473255)	22.1
tar (PI 414148)	17.0
US-W 2668 x chc (PI 473405)	11.4
chc (PI 265576)	10.0
chc (PI 473402)	7.0
chc (PI 133123)	4.3
chc (PI 473405)	1.1

* alpha= 0.05, df= 1,197, T= 1.96, LSD= 7.6697

EAST REGIONAL POTATO TRIALS

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Cooperators in 1998: Delaware, Ed Kee; Maine, Gregory Porter; Florida, Pete Weingartner (data not presented in this report); New Brunswick, Henry DeJong and Peter Scott; North Carolina, Craig Yench; New Jersey, Mel Henninger; Long Island, New York, Joe Sieczka; Upstate New York, Don Halseth; Ohio, Mark Bennett; Pennsylvania, William Lamont Jr.; Prince Edward Island, Walter Arsensault; Quebec, Pierre Turcotte; and Virginia, Rikki Sterrett.

Thirty-four trials were conducted in eight states and three Canadian Provinces. Nineteen named varieties and 18 numbered clones were available to the cooperators. Seed for all clones and varieties were grown by the Maine State Seed Potato Board at Porter Farm. Seedpieces were prepared, cut, and suberized by the staff at the University of Maine Agricultural and Forest Experiment Station in Presque Isle, Maine. Cultural practices were generally similar to those used by commercial growers near each location.

Objectives: The objectives of this regional project are (1) to develop pest-resistant, early maturing, long-dormant varieties that will process from cold storage; (2) to evaluate new and specialty varieties developed in the Northeast; (3) to determine climatic effects on performance to develop predictive models for potato improvement; and (4) determine heritability/linkage relationships and improve the genetic base of tetraploid cultivated varieties.

Results: Total yield, marketable yield, specific gravity, tuber size, tuber defects, chip color results, boil and bake results are presented in East Region Trial Tables one through five.

For round whites, Atlantic, Itasca, Katahdin, Kennebec, Snowden, AF1437-1, AF1615-1, B0564-8, B0766-3, and NY103 produced the best marketable yields in many locations. Of these ten selections, Atlantic, Snowden, B0564-8, and B0766-3 had the highest specific gravities. Atlantic, Kennebec, Yukon Gold, B0766-3, and NY103, produced good sized tubers (2.5 to 4 inch diameter) at most locations. Itasca, Niska, Snowden, B0564-8, NY102, and especially MaineChip produced small

tubers at most trial sites. Atlantic, MaineChip, Yukon Gold, AF1480-5, and B0766-3 had hollow heart problems in some locations. AF1615-1, AF1565-12, NY103, Katahdin, and Kennebec were prone to sunburning in some trials. B0564-8 had few external and internal problems.

MaineChip has produced the lightest chips over the years; however, the yields have been very low. Snowden, AF1424-7, B0564-8, B0766-3, and NY103 chipped very well out of the field. B0766-3, AF1424-7, NY102, and Snowden chipped best out of warm storage. Except for MaineChip, no clone has consistently chipped well out of 45°F storage. Monona chipped well after reconditioning in 1994 and 1995 in Maine and Upstate New York. Overall (considering marketable yield, specific gravity, tuber size, chip scores, boil, and bake scores), B0766-3 and NY103 were the best performing round white clones in the Eastern United States and Eastern Canada.

For red clones, Chieftan and B0811-13 produced the highest marketable yields in most trials and had the largest tubers. B0811-13 had the highest specific gravity. Chieftan had both good boil and bake scores, while B0811-13 had good boil scores but poor bake scores (as did the other remaining varieties).

Century Russet, Russet Burbank, Russet Norkotah #3, Russet Norkotah #8, A84180-8, A86102-6, and AO82611-7 had good marketable yields in most locations in 1998. A86102-6 and A84118-3 had high specific gravities at most locations, and their values were higher than Russet Burbank's specific gravity in all comparisons. Century Russet, Russet Norkotah #3, Russet Norkotah #8, and Shepody produced the highest percentage of tubers greater than eight ounces. Century Russet, Russet Burbank, Russet Norkotah, Russet Norkotah #3, A84118-3, A86102-6, AO82611-7, and B1004-8 had hollow heart of 5% or higher in some trials. Century Russet, Russet Burbank, Russet Norkotah #8, Shepody, A81386-1, A86102-6, AO82611-7, and W1099Rus had misshapen tubers over 5% at some sites. Most clones had good boil and bake scores. Overall, no russet/long white was outstanding in 1998.

East Region Trial Table 1. Total yields (cwt/acre) for 19 named varieties and 18 numbered clones grown at 16 locations in the Eastern United States and Eastern Canada.

Clone	DE	ME1 ¹	ME2 ¹	ME3 ¹	NB	NC	NJ	NY1 ²	NY2 ²	OH	PA	PEI	QU1 ³	QU2 ³	QU3 ³	VA	Mean
<u>Round Whites</u>																	
Atlantic	307	469	401	387	427	351	503	492	373	264	277	374	437	297	355	319	389
Itasca		460	435	364		293	437		433		291						388
Katahdin	297	448	487	423	471	265	495	453	382	273	268	414	391	277	357	300	388
Kennebec	293	423	532	430	478	377	537	563	357	252	340	430	577	246	402	352	421
MaineChip		325	325					227			200						269
Monona		346	345					385	301		178						311
Niska		317	422			312	421				280		347	178	293		321
Snowden		318	383	317		292		340		275	308		378	281	329		329
Superior	224	429	328	384	398	298	345	498	372	242	267	300	368	213	391	325	339
Yukon Gold	230	426	471	381	417	220	343	381	337	310	259	317	319	214	327		330
AF1424-7			345			222		363	310	310	248		429	213	312	267	301
AF1437-1	282	427	392	367	418	291	543	491	328	233	286	375	442	283	298	328	361
AF1480-5	338			361						237	331						317
AF1565-12		392		323		164		414		302	197					260	293
AF1615-1	375	422	504	426	441	288	518	485	336	272	361	409	401	242	334	351	385
B0564-8	302	389	367	378	402	295	445	445	319	300	254	296	437	242	385	345	350
B0766-3	302	380	440	351	482	257	450	536	412	250	310	389	440	282	358	290	371
NY102		387	446	356		273				236	239					275	316
NY103	314	369	459	366	458	229	359	521	356	252	238	299	385	234	361	341	349

East Region Trial Table 1 continued.

Clone	DE	ME1 ¹	ME2 ¹	ME3 ¹	NB	NC	NJ	NY1 ²	NY2 ²	OH	PA	PEI	QU1 ³	QU2 ³	QU3 ³	VA	Mean
<u>Red Clones</u>																	
Chieftain	518			448		271	589	553	420				490	340		257	432
Dark Red Norland	378			302		226	329	358	269	289						135	286
NorDonna	298			347		242	489		343	186						242	307
B0811-13	365			389		282		454	332	224							341
<u>Russets/Long Whites</u>																	
Century R	272	368		379		361	469		394		349					295	361
R Burbank	471			402	464				377			388	351	207	394		382
R Norkotah	181	341		421	365	272	370		283		289	273	338	192	321	315	305
R Norkotah-3			363		443	416	228	522		307		291	370			289	359
R Norkotah-8	347			455	388	274	522		336		301	330				384	371
Shepody	370			416					284				338	241	376		338
A81386-1	327			399		281			368		312						337
A84118-3	314			306	363	179	311		324		215	377					299
A84180-8	366			383	409	221	516		274		269	316					344
A86102-6	349			441	301		436		379		336	403					378
AO82611-7	398			467	396				351		308		277	240			348
B1004-8	322			320	379	224					275		344	174	257	336	292
COO83008-1	331			353	402	181	167		290		186		262	166	210		255
W1099Rus	215	330		320		229					287	295				318	285

¹Trials were conducted in three locations in Maine, Presque Isle (ME1), Exeter (ME2), and St. Agatha (ME3).²The two locations in New York were Riverhead, Long Island (NY1), and Freeville (NY2).³There were three trials in Quebec, Canada; Lanoraie (QU1), Shipshaw (QU2), and La Pocatière (QU3).

East Region Trial Table 2. Marketable yields (cwt/acre) for 19 named varieties and 18 numbered clones grown at 16 locations in the Eastern United States and Eastern Canada.

Clone	DE	ME1 ¹	ME2 ¹	ME3 ¹	NB	NC	NJ	NY1 ²	NY2 ²	OH	PA	PEI	QU1 ³	QU2 ³	QU3 ³	VA	Mean
<u>Round Whites</u>																	
Atlantic	260	439	298	230	402	326	458	419	305	180	243	354	375	273	327	249	334
Itasca		414	363	263		271	366		362		242						326
Katahdin	252	384	319	166	440	247	463	374	321	205	228	396	367	240	321	177	321
Kennebec	249	362	279	140	421	332	483	341	267	151	300	419	547	224	342	262	331
MaineChip		267	218						156		113						189
Monona		321	274					326	240		154						263
Niska		299	363			295	381				228		322	143	229		282
Snowden		297	311	236		281			299	217	266		359	241	278		285
Superior	181	399	237	311	379	284	317	456	315	167	240	289	338	180	333	231	295
Yukon Gold	196	386	381	199	407	197	322	329	308	248	241	301	306	185	287		286
AF1424-7			291			205			333	223	224		392	194	270	194	258
AF1437-1	238	393	335	81	404	278	456	429	253	158	249	351	397	249	278	261	301
AF1480-5		286		116						154	290						212
AF1565-12		339		227		152			311	230	160					170	227
AF1615-1	321	291	381	85	406	265	477	408	269	196	315	378	359	208	288	251	306
B0564-8	231	363	324	316	375	280	395	376	269	231	211	269	409	196	333	245	301
B0766-3	265	359	362	161	445	248	420	489	332	158	280	370	384	250	323	225	317
NY102		367	384	200		250				163	195					190	250
NY103	277	338	349	157	437	187	334	437	292	176	215	284	355	209	319	272	295

East Region Trial Table 2 continued.

Clone	DE	ME1 ¹	ME2 ¹	ME3 ¹	NB	NC	NJ	NY1 ²	NY2 ²	OH	PA	PEI	QU1 ³	QU2 ³	QU3 ³	VA	Mean
Red Clones																	
Chieftain		480		261		191	517	487	382				467	296		175	362
Dark Red Norland		351		184		203	310	287	214	205						256	226
NorDonna		262		277		215	435		291	115						132	247
B0811-13		341		316		265		409	282	172							298
Russets/Long Whites																	
Century R 125		350		227		302	363		231		284					170	256
R Burbank		455		223	406				186			310	305	106	311		288
R Norkotah 47		337		362	314	246	285		170		243	211	316	156	257	178	240
R Norkotah-3		347		250	388	197	417		209		236	345				187	286
R Norkotah-8		342		260	359	236	433		210		253	296				255	294
Shepody		318		0					148				305	176	297		207
A81386-1		303		219		267		205			226						244
A84118-3		309		250	346	163	246		155		182	275					241
A84180-8		360		327	377	154	390		166		183	217					272
A86102-6		322		348	274		297		188		277	307					288
AO82611-7		361		364	372				192		229		256	200			282
COO83008-1		329		277	390	158	135	214			154		243	132	141		217
B1004-8		317		91	368	205					237		302	141	187	196	227
W1099Rus 78		315		162		219					243	235				227	211

¹Trials were conducted in three locations in Maine, Presque Isle (ME1), Exeter (ME2), and St. Agatha (ME3).²The two locations in New York were Riverhead, Long Island (NY1), and Freeville (NY2).³There were three trials in Quebec, Canada; Lanoraie (QU1), Shipshaw (QU2), and La Pocatière (QU3).

East Region Trial Table 3. Specific gravities (1.0 excluded) for 19 named varieties and 18 numbered clones grown at 16 locations in the Eastern United States and Eastern Canada.

Clone	DE	ME1 ¹	ME2 ¹	ME3 ¹	NB	NC	NJ	NY1 ²	NY2 ²	OH	PA	PEI	QU1 ³	QU2 ³	QU3 ³	VA	Mean
<u>Round Whites</u>																	
Atlantic	78	92	94	96	88	81	75	90	94	88	95	97	90	81	87	82	88
Itasca		82	77	82		66	66		78		77						75
Katahdin	66	81	81	85	78	63	62	75	76	73	75	81	71	63	80	65	73
Kennebec	69	81	81	84	81	68	68	74	81	79	81	87	77	62	82	70	76
MaineChip		103	101						95		103						101
Monona		72	69					67	75		75						72
Niska		80	82			70	69				81		73	65	76		75
Shepody		83															83
Snowden		91	98	100		79			92	86	91		86	76	86		89
Superior	71	83	79	90	81	64	67	76	76	76	75	86	76	73	74	70	75
Yukon Gold	72	84	89	92	80	72	69	81	84	79	86	91	78	74	79		81
AF1424-7			85			77		84	84	84	92		90	82	81	80	84
AF1437-1	56	66	66	68	64	53	51	62	73	73	69	75	59	59	59	55	63
AF1480-5		83		84						79	85						83
AF1565-12		72		76		58			71	74	81					63	71
AF1615-1	70	86	83	87	77	62	71	80	81	83	88	86	74	64	79	66	77
B0564-8	72	85	81	89	81	77	70	76	78		78	93	76	77	79	78	79
B0766-3	68	86	85	92	83	76	71	83	83	79	87	93	80	71	86	78	81
NY102		92	87	92		69				85	92					75	85
NY103	62	76	77	80	73	64	62	72	77	77	71	81	72	70	79	73	72

East Region Trial Table 3 continued.

Clone	DE	ME1 ¹	ME2 ¹	ME3 ¹	NB	NC	NJ	NY1 ²	NY2 ³	OH	PA	PEI	QU1 ⁴	QU2 ⁴	QU3 ⁴	VA	Mean
<u>Red Clones</u>																	
Chieftain	72			76		60	72	64	73				68	66	59		68
Dark Red Norland	68			74		62	68	59	67	73						51	65
NorDonna	71			75		58	69		70	70						58	67
B0811-13	73			81		64		65	81	81							74
<u>Russets/Long Whites</u>																	
Century R	72	80		83		74	86		82		92					71	80
R Burbank		85		88	83				83		85	85	75	63	81		80
R Norkotah	70	72		77	68	63	80		73		77	80	68	68	74	64	72
R Norkotah-3		76		84	76	61	84		82		85	84				66	78
R Norkotah-8		72		82	73	64	77		76		82	79				68	75
Shepody		81		83					82				78	68	78		78
A81386-1		75		80		66			83		87						78
A84118-3		90		84	84	63	89		90		91	98					86
A84180-8		81		85	78	60	82		82		78	83					79
A86102-6		85		85	84		86		88		95	89					87
AO82611-7		88		87	87				86		88		67				81
B1004-8		85		82	82	66					87		76	79	76	72	78
COO83008-1		90		91	81	61	78		80		82		71	73	76		78
W1099Rus	63	78		79		57					73	81				67	71

¹Trials were conducted in three locations in Maine, Presque Isle (ME1), Exeter (ME2), and St. Agatha (ME3).²The two locations in New York were Riverhead, Long Island (NY1), and Freeville (NY2).³There were three trials in Quebec, Canada; Lanoraie (QU1), Shipshaw (QU2), and La Pocatière (QU3).

East Region Trial Table 4. Percent of marketable yield of tubers in the 2.5 to 4 inch size range for round whites and reds and russets greater than eight ounces for 19 named varieties and 18 numbered clones grown at 11 locations in the Eastern United States and Eastern Canada.

Clone	DE	ME1 ¹	ME2 ¹	ME3 ¹	NB	NJ	NY1 ²	NY2 ²	PA	PEI	VA	Mean
<u>Round Whites</u>												
Atlantic	40	66	57	63	63	40	60	42	58	67	58	53
Itasca		25	42	39		26		49	19			33
Katahdin	24	62	59	58	67	41	53	45	48	69	29	50
Kennebec	26	60	61	71	62	48	39	47	69	72	47	55
MaineChip		8	5					5	10			7
Monona		57	52				46	42	47			49
Niska		49	50			33			26			40
Snowden		39	34	43				21	31			33
Superior	20	55	40	71	67	23	61	54	50	54	38	47
Yukon Gold	42	68	60	58	66	48	58	57	68	62		59
AF1424-7			45					58	45		48	49
AF1437-1	31	40	50	53	70	42	60	39	45	57	49	49
AF1480-5		51		54					44			50
AF1565-12		51		51				53	27		35	43
AF1615-1	29	38	48	54	58	39	46	31	41	51	41	43
B0564-8	23	30	29	57	47	34	52	16	35	36	40	36
B0766-3	34	59	68	68	66	53	71	58	62	60	54	59
NY102		35	48	48					27	45		41
NY103	39	52	64	59	71	61	64	64	42	56	58	58

East Region Trial Table 4 continued.

Clone	ME1 ¹	ME3 ¹	NB	NJ	NY1 ²	NY2 ²	PA	PEI	VA	Mean
<u>Red Clones</u>										
Chieftain	45	49		62	47	47			41	49
Dark Red Norland	29	31		53	17	25			11	28
NorDonna	25	33		52		17			24	30
B0811-13	50	56			60	18				46
<u>Russets/Long Whites</u>										
Century Russet	52	55		65					5	38
Russet Burbank	44	51				26		22		36
Russet Norkotah	40	43		49		25			10	28
Russet Norkotah-3	57	60		68		26			6	43
Russet Norkotah-8	46	57		74		42			11	46
Shepody	48	60				40				49
A81386-1	41	52				23				39
A84118-3	21	27		39		4		12		21
A84180-8	33	31		59		18		9		30
A86102-6	27	37		33		13		18		26
AO82611-7	34	43				19				32
B1004-8	16	17							9	14
COO83008-1	35	45		30		42				38
W1099Rus	52	59						26	13	30

¹Trials were conducted in three locations in Maine, Presque Isle (ME1), Exeter (ME2), and St. Agatha (ME3).

²The two locations in New York were Riverhead, Long Island (NY1), and Freeville (NY2).

East Region Trial Table 5. Average (sites x years) percent tuber defects and hollow heart, chip color, and bake and boil scores for 19 named and 18 numbered clones. Number of comparisons (sites x years) are in parentheses.

Variety	Year(s)	Total ¹	% Tuber Defects -----				----- Chip Color ² -----				Recon- ditioned ⁵	Boil Score ³	Bake Score ³
			Sun- burn	Mis- shapen	Growth cracks	Hollow Heart	Out of Field ⁴	50-55°F Storage	45°F Storage				
Round Whites													
Atlantic	1998	11.5(9)	3.5(9)	3.2(9)	2.0(9)	6.4(14)	1 2 0	4 2 5	1 0 1	0 1 0	4 1 1	2 1 0	
Atlantic	9	8.7(60)	3.7(58)	2.2(61)	1.5(64)	6.4(77)	21 12 6	33 11 18	6 3 13	8 5 7	16 8 7	17 6 1	
Itasca	1998	11.4(4)	1.5(5)	3.7(4)	1.0(4)	0.4(7)	0 0 1	2 0 2	1 0 0		1 0 0	1 0 0	
Itasca	2	8.0(9)	1.9(10)	2.6(9)	1.1(9)	2.5(15)	0 0 2	4 1 8	2 0 2	1 0 0	5 1 0	2 1 0	
Katahdin	1998	18.3(7)	6.6(7)	2.5(7)	0.4(7)	6.0(12)		0 1 5	0 0 2	0 0 1	5 1 0	2 1 0	
Katahdin	9	10.2(57)	5.4(55)	1.3(55)	0.6(57)	4.6(78)	6 6 14	3 9 26	0 1 19	1 1 12	15 16 1	11 11 3	
Kennebec	1998	29.7(6)	8.5(6)	6.3(6)	2.5(6)	1.8(11)	1 0 0	3 2 5	1 0 1	0 0 1	5 1 0	1 1 0	
Kennebec	9	16.7(45)	6.3(45)	4.2(45)	3.1(45)	3.4(64)	5 4 15	11 13 28	3 1 17	4 1 14	17 11 4	8 12 4	
MaineChip	1998	2.8(3)	1.1(3)	1.3(3)	0.2(3)	3.1(4)		3 0 0	1 0 0		1 0 0	1 0 0	
MaineChip	9	8.1(33)	3.7(33)	1.7(33)	1.5(33)	7.3(33)	9 1 1	32 1 1	9 1 2	6 2 3	4 6 1	3 5 2	
Monona	1998	7.3(4)	3.7(4)	2.7(4)	0.1(4)	1.0(5)		2 1 0	1 0 0		1 0 0	1 0 0	
Monona	5	9.6(16)	3.1(16)	3.8(16)	0.9(16)	2.1(18)	1 0 0	8 4 2	4 0 2	11 0 1	1 3 0	3 1 0	
Niska	1998	5.0(2)	2.6(2)	1.6(2)	0.6(2)	0.0(5)	0 1 0	3 2 1	1 0 0		4 0 0	1 0 0	
Niska	3	12.9(7)	3.4(7)	2.9(7)	2.5(7)	3.3(15)	4 3 0	9 6 5	3 0 4	2 1 0	11 1 0	5 0 0	
Snowden	1998	7.1(5)	2.0(5)	3.0(5)	0.4(5)	1.3(8)	1 0 0	4 1 2	1 0 0		2 2 0	1 0 0	
Snowden	7	4.9(30)	2.3(29)	1.6(29)	0.3(29)	2.1(40)	16 3 1	20 7 8	5 2 3	4 1 1	7 4 6	6 2 3	
Superior	1998	10(6)	2.2(6)	5.5(6)	0.8(6)	2.1(11)	1 1 0	2 3 3	0 1 1	0 0 1	5 0 1	2 1 0	
Superior	9	4.9(46)	1.0(44)	2.6(44)	1.0(46)	1.4(71)	13 7 17	10 10 22	1 3 15	0 3 9	16 10 6	11 10 3	
Yukon Gold	1998	12.5(6)	2.2(6)	3.9(6)	0.4(6)	5.1(10)		1 0 5	0 0 2	0 0 1	6 0 0	3 0 0	
Yukon Gold	9	8.8(23)	1.7(23)	2.5(23)	0.8(23)	7.5(36)	2 0 4	2 2 17	0 1 5	0 0 3	10 6 1	7 3 0	
AF1424-7	1998	7.2(2)	3.2(2)	3.1(2)	0.3(2)	0.5(5)	1 0 0	3 2 0	1 0 0		4 0 0	1 0 0	
AF1424-7	5	9.5(12)	1.8(12)	1.6(12)	1.2(14)	1.7(25)	10 1 1	19 6 5	7 1 5	3 3 0	10 4 0	6 1 1	
AF1437-1	1998	18.5(6)	1.2(6)	1.5(6)	3.8(6)	0.0(10)	1 0 1	2 3 1	0 0 2	0 0 1	6 0 0	1 0 2	
AF1437-1	2	15.4(10)	1.2(10)	1.0(10)	3.5(11)	0.3(19)	2 0 1	2 5 2	0 0 4	0 0 2	8 1 1	2 0 2	
AF1480-5	1998	33.9(2)	2.8(2)	2.2(2)	0.1(2)	0.6(4)		2 0 0	0 1 0		0 0 1	1 0 0	
AF1480-5	3	15.5(8)	3.3(8)	3.8(8)	0.1(8)	12.8(16)	2 1 2	3 2 4	0 0 5	0 0 2	2 2 4	1 2 1	
AF1565-12	1998	16.9(3)	6.9(3)	3.3(3)	2.6(3)	2.2(6)	1 0 0	0 1 1	0 1 0		1 0 1	2 0 0	
AF1565-12	4	11.9(10)	4.5(10)	2.4(10)	3.1(12)	2.2(21)	6 0 3	3 5 5	0 2 5	0 1 3	2 5 1	3 2 0	

Region Trial Table 5 continued.

Variety	Year(s)	Total ¹	% Tuber Defects			Hollow Heart	Chip Color ²			Recon- ditioned ⁵	Boil Score ³	Bake Score ³
			Sun- burn	Mis- shapen	Growth cracks		Out of Field ⁴	50-55°F Storage	45°F Storage			
AF1615-1	1998	20.0(6)	4.0(6)	2.8(6)	0.5(6)	0.3(10)	110	114	101	001	510	201
AF1615-1	2	15.2(10)	5.0(10)	2.2(10)	0.4(11)	1.2(19)	120	126	102	002	622	301
B0564-8	1998	4.0(6)	0.8(6)	1.0(6)	0.1(6)	0.3(10)	300	322	101	010	501	102
B0564-8	6	3.7(23)	1.3(22)	0.5(22)	0.1(23)	1.1(36)	1550	9108	308	124	1323	623
B0766-3	1998	13.7(6)	2.3(6)	4.0(6)	0.1(6)	3.1(10)	300	520	101	010	420	210
B0766-3	2	10.7(10)	1.6(10)	3.2(10)	0.1(10)	4.5(19)	500	1051	212	110	831	420
NY102	1998	16.9(3)	2.4(3)	1.7(3)	0.3(3)	0.4(6)	010	310	100		100	100
NY102	3	9.8(11)	2.4(11)	1.1(11)	0.7(11)	2.3(20)	310	963	313	201	522	221
NY103	1998	19.0(6)	5.6(6)	4.7(6)	0.6(6)	1.9(11)	200	334	101	001	510	300
NY103	3	15.2(16)	6.5(15)	3.3(15)	0.5(17)	1.4(28)	710	898	305	112	1032	620
Red Clones												
Chieftain	1998	11.1(4)	1.0(4)	1.8(4)	2.5(4)	0.0(6)		001			200	
Chieftain	9	4.5(24)	1.1(23)	1.1(25)	1.2(24)	0.8(32)	102	0213	003		921	420
NorDonna	1998	4.5(3)	1.0(3)	1.7(3)	0.0(3)	0.0(6)		001				
NorDonna	4	3.4(12)	1.5(12)	1.0(12)	0.1(12)	0.7(23)	001	1011	005	002	220	031
Norland, Dk Red	1998	9.6(4)	1.1(4)	1.5(4)	1.3(4)	0.0(7)		010				
Norland, Dk Red	6	4.5(17)	0.5(16)	1.4(16)	1.0(16)	1.0(30)	214	165	002		221	221
B0811-13	1998	5.4(4)	1.1(4)	4.0(4)	0.2(4)	0.0(6)		010			200	
B0811-13	2	4.0(9)	1.1(8)	3.0(8)	0.2(8)	0.2(8)	100	231	002	001	511	002

East Region Trial Table 5 continued.

Variety	Year(s)	----- % Tuber Defects -----				----- Chip Color ² -----				Recon- ditioned ⁵	Boil Score ³	Bake Score ³
		Total ¹	Sun- burn	Mis- shapen	Growth cracks	Hollow Heart	Out of Field ⁴	50-55°F Storage	45°F Storage			
<u>Russets/Long Whites</u>												
Century Russet	1998	23.1(3)	6.5(3)	7.0(3)	1.9(3)	1.0(6)		1 02	0 01		1 00	1 00
Century Russet	4	13.7(12)	3.6(11)	5.5(11)	0.8(11)	6.1(21)	0 01	1 28	0 07	0 03	2 20	2 10
Russet Burbank	1998	19.7(4)	1.5(4)	14.7(4)	0.6(4)	5.6(4)		0 02			5 00	1 10
Russet Burbank	9	16.8(40)	1.3(40)	13.8(40)	1.2(40)	9.4(46)	0 10	1 35	0 011	0 010	15 43	8 110
Russet Norkotah	1998	6.7(4)	1.4(4)	3.7(4)	0.4(4)	6.4(7)		0 15	0 02	0 01	5 10	2 10
Russet Norkotah	2	6.0(7)	1.3(7)	3.1(7)	0.3(7)	4.8(12)		0 18	0 04	0 02	5 10	2 10
Russet Norkotah-3	1998	15.3(4)	1.5(4)	4.7(4)	0.3(4)	9.0(7)		1 05	1 01	0 01	2 01	3 00
Russet Norkotah-8	1998	16.9(4)	1.9(4)	5.5(4)	0.2(4)	3.2(7)		1 05	0 11		2 10	3 00
Shepody	1998	45.5(3)	7.4(3)	10(3)	0.3(3)	2.5(3)		0 11			3 00	
A81386-1	1998	24.5(3)	7.7(3)	6.6(3)	0.2(3)	0.5(5)		1 01	1 00		1 00	1 00
A84118-3	1998	8.3(4)	3.1(4)	5.1(4)	0.1(4)	6.4(7)		1 04	1 01	0 01	3 00	1 10
A84180-8	1998	6.8(4)	1.2(4)	3.9(4)	1.7(4)	4.0(7)		0 14	0 02	0 01	1 11	1 20
A86102-6	1998	11.5(4)	2.0(4)	7.1(4)	1.5(4)	9.2(6)		0 14	0 11	0 01	3 00	2 10
AO82611-7	1998	17.3(3)	2.6(3)	13.3(3)	1.0(3)	8.1(4)		1 13	0 11	0 01	4 00	2 00
B1004-8	1998	21.1(2)	0.2(2)	1.2(2)	3.1(2)	0.6(4)		0 23	0 02	0 01	5 00	2 00
B1004-8	2	11.5(7)	1.1(7)	1.1(7)	2.6(7)	5.4(14)	0 01	0 28	0 06	0 02	9 02	4 10
COO83008	1998	11.3(3)	1.0(3)	4.8(3)	4.6(3)	2.1(6)		2 21	1 01	0 10	5 00	2 00
W1099Rus	1998	19.8(3)	0.4(3)	10.6(3)	0.9(3)	0.0(5)		1 11	0 01		2 00	1 10
W1099Rus	3	13.7(9)	1.1(9)	5.0(9)	1.1(9)	4.0(16)		1 17	0 06	0 02	4 02	1 40

¹Total tuber defects may include defects other than the four listed (eg. rot and common scab).²From left-to right, the scores are good, borderline, and poor.³From left-to-right, the scores are good, fair, and poor.⁴Out of field samples were fired three to twelve days after harvest in New Jersey, North Carolina and Virginia.⁵Chips were reconditioned in trials at Maine, Upstate New York, and New Brunswick.

NORTH CENTRAL REGIONAL POTATO TRIALS

Richard Novy, Assistant Professor, Bryce Farnsworth and Mike Schwalbe, Research Specialists, Plant Sciences Dept., North Dakota State University and Cooperators

Cooperators in 1998:

Alberta, Dr. Clive Schaupmeyer and Dr. Dermot Lynch; Iowa, Dr. Bill Summers; Louisiana, Dr. Charlie Johnson and Mr. Gil Barker; Michigan, Dr. Dave Douches; Manitoba, Dr. Dale Tomasiewicz; Minnesota, Dr. Christian Thill; Nebraska, Dr. Alexander D. Pavlista; Ohio, Mr. Dave Kelly; Wisconsin, Dr. Jiming Jiang, Dr. Horia Groza, and Mr. Bryan Bowen. Thanks also to Marty Glynn of the USDA-ARS-NPA Potato Research Worksite (East Grand Forks, MN) for his aid in evaluating the chipping performance of NCRPVT entries.

Eight states and two Canadian provinces participated in the North Central Regional Trials in 1998. In 1999, the province of Ontario will become the 11th participating site.

Cooperating States and Provinces in 1998

STATE OR PROVINCE	DATE PLANTED	TOTAL DAYS TO VINE KILL	TOTAL DAYS TO HARVEST	I/D ¹
Alberta	5/12	120	140	I
Manitoba	5/6	133	133	I
Michigan	5/4	121	128	I
Minnesota	4/15	140	140	I
Nebraska	5/16	136	143	I
North Dakota	5/22	110	118	D
Ohio	5/19	104	128	D
Wisconsin	4/22	111	127	I

¹ I = Irrigated; D = Dryland

Trial conditions: The overall objective of the trial is to test the performance of advanced breeding clones for uniformity over a wide variety of locations and environments. The trial in Louisiana was lost to drought in 1999. Yields of certain entries were reduced in the Alberta trial due to an error in the application of Sencor which resulted in a doubling of the recommended rate. Sencor damage at the Alberta site was observed for FV8957-10, MN17572, MSB073-2, ND2676-10, ND4093-4Russ, Red Pontiac, and W1355-1. A combination of cool, wet weather from Mid-July to Mid-August coupled with psyllid infestation at the same time also negatively impacted yields in Nebraska. Data is reported for Alberta and Nebraska in all tables, but regional averages for Tables 1, 2 and 3, do not include Alberta or Nebraska. No site report was submitted by

Iowa in 1998.

Entries: Eighteen advanced selections were received from Alberta, Michigan, Minnesota, North Dakota, and Wisconsin. Seed of the check varieties Norchip, Atlantic, Snowden, Red Norland, Red Pontiac, Russet Burbank, and Russet Norkotah were supplied by North Dakota in order to ensure a standard seed source. The selections, number of years in the trial (YIT), and descriptions are given below:

Selection	YIT	Description
W1S75-30	1	white chipper
FV8957-10	1	white chipper
MN16478	1	russet
MN16966	2	processor with white skin, yellow-flesh
MN17572	1	red tablestock
MN17922	1	red tablestock
MSA091-1	1	chipper
MSB073-2	2	chipper with netted skin
MSE192-8rus	1	russet
MSE230-6	1	chipper
ND2470-27	1	white chipper
ND2676-10	3	white chipper
ND4093-4Russ	1	russet
ND5084-3R	1	red tablestock
W1151rus	3	russet tablestock
W1313	3	white chipper
W1348rus	2	dual purpose russet
W1355-1	1	white chipper

Total and US No. 1 Yield: For the second-year, MN16966 at 530 cwt/A had the highest total yield across the four irrigated sites. Red Pontiac (523 cwt/A), and ND5084-3R (510 cwt/A), rounded out the top three for total yield. Under dryland conditions at the North Dakota and Ohio sites, ND5084-3R (336 cwt/A), MN16966 (315 cwt/A), and ND2676-10 (314 cwt/A) were the top three entries for total yield. (North Central Regional Trial Table 1).

MN16966 (466 cwt/A), ND5084-3R (464 cwt/A), and Red Pontiac (462 cwt/A) were the top three entries for U.S. No. 1 yield under irrigation. Under dryland conditions, ND5084-3R (290 cwt/A), Red Pontiac (260 cwt/A), and ND2676-10 (251 cwt/A) were the top three entries for U.S. No. 1 yield. (North Central Regional Trial Table 2).

Percent U.S. No. 1: The range for percent U.S. No. 1 at the irrigated sites was 77% (Russet Burbank, W1355-1, and W1348rus) to 93% (MN17922). Under dryland growing conditions, ND5084-3R had the highest U.S. No. 1

percentage at 87%; Russet Burbank had the lowest U.S. No. 1 percentage at 51% (North Central Regional Trial Table 3).

Maturity: Red Norland was the earliest maturing entry while ND5084-3R was the latest maturing. Among submitted selections, ND4093-4Russ was the earliest-maturing. (North Central Regional Trial Table 4).

Specific Gravities: W1313 had the highest specific gravity at 1.095, followed by Atlantic at 1.091. W1313 has consistently had the highest specific gravity among all entries in each of the three years it was entered in the NCRPVT. As expected, the lowest specific gravities were observed in the red cultivars and selections (1.061-1.066). (North Central Regional Trial Table 5).

Scab Reaction: Scab ratings were taken and reported from five sites. In general, reported scab area was minimal at most sites, with the exception of North Dakota where several entries were noted as having 41–60% of their tuber surfaces covered by scab. Severe scab was observed in Nebraska and Ohio, where several entries were rated as having large to very large pustules with deep holes. (North Central Regional Trial Table 6).

The percentage of tubers displaying scab symptoms under irrigation was highest in FV8957-10 and Red Pontiac—both at 19.0%, followed by W1313 at 16.3%. The russet selections, W1348rus, ND4093-4Russ, MSE192-8rus and Russet Burbank, had little or no reported scab. Under dryland growing conditions, the incidence of scab was relatively low with the exception of W1151rus (12.5%) and WIS75-30 (26.5%). (North Central Regional Trial Tables 7a and 7b).

Summary of Grade Defects: The incidence of external defects among entries at the irrigated sites was low with the average external defects for all entries being 5%. Freedom from internal defects ranged from 79.4% (MN16478) to 98.2% (ND4093-4Russ and Red Norland). Vascular discoloration was the most frequently reported internal defect with tubers of Norchip, MN16478, MN16966, W1151rus displaying >10% vascular discoloration. (North Central Regional Trial Table 7a).

At the two dryland sites, vascular discoloration (as noted for the irrigated sites) was again observed for MN16478. Greater than 10% hollow heart was observed for Atlantic, Russet Norkotah, and ND4093-4Russ. Interestingly, 1% hollow heart was noted for ND4093-4Russ under irrigation, but under dryland production 22% of tubers displayed hollow heart—indicating this entry might be better suited for irrigated production. (North Central Regional Trial Table 7b).

Chip Color: Chip color results are reported as Hunter or Agtron values (North Central Regional Trial Table 8a) or PCII Color Chart values (North Central Regional Trial Table 8b). This was the first year of a cooperative arrangement with the USDA/ARS-NPA Potato Research Worksite. Shortly after harvest, tubers of chipping entries were sent from Michigan, Minnesota, North Dakota, and Wisconsin for evaluation. Tubers were chipped shortly after arrival at the worksite or stored at 50°F or 42°F for 3 or 7 months. At this time, the data for 7 month storage has not yet been obtained and is not reported.

Using a standard of >55 for Hunter and Agtron values as being acceptable, the majority of chipping entries chipped well from the field. After 3 months storage at 50°F with no reconditioning, all entries produced acceptable chips, with the exception of MN16478 (very close at 54). After 3 months storage at 42°F with no reconditioning, ND2676-10 displayed the best cold-sweetening resistance with a Hunter value of 60. Other entries with >55 Hunter values included ND2470-27, Norchip, Snowden, W1313, W1355-1, and WIS75-30.

Overall Merit Ratings: The following summary shows the top entries from 1998 and indicates the total points based on merit rating for these entries over the previous two years. (North Central Regional Trial Table 9).

Selection	Total Points		
	1996	1997	1998
ND2676-10	4	7	16
ND5084-3R	NE	NE	14
Atlantic	4	3	11
Red Pontiac	0	5	11
MN17922	NE	NE	11
Russet Norkotah	4	12	7
ND2470-27	NE	NE	6

*Not Entered

Summary of 3-year performance: ND2676-10, W1313, and W1151rus had their last trial year in 1998. For merit ratings among the top five during the three years, ND2676-10 ranked 5th (tied), and 1st, in 1997 and 1998. W1313 ranked 5th in 1996 and 1st in 1997. W1151rus ranked 5th (tied) in 1997. Yield comparisons of the three entries with check cultivars during the three years are shown in North Central Regional Trial Table 10.

North Central Regional Trial Table 1. Total Yield (cwt/acre) - 1998

Cultivar or Selection	Man^{1/}	MI^{1/}	MN^{1/}	WI^{1/}	Ave.	ND^{2/}	OH^{2/}	Ave	Alb^{3/}	NE
Atlantic	398	378	402	432	403	229	258	244	390	246
Norchip	286	358	444	394	371	312	248	280	555	250
Red Norland	264	329	415	451	365	256	292	274	444	220
Red Pontiac	486	518	671	416	523	278	302	290	230	252
Russet Burbank	292	352	547	463	414	142	223	183	345	70
Russet Norkotah	354	215	526	449	386	300	275	288	549	142
Snowden	342	366	620	329	414	267	259	263	513	187
FV8957-10	282	285	357	403	332	279	290	285	233	241
MN16478	232	198	584	400	354	276	204	240	389	130
MN16966	418	487	772	441	530	305	324	315	628	94
MN 17572	338	389	508	437	418	297	268	283	347	205
MN 17922	285	387	564	453	422	227	265	246	339	109
MSA091-1	301	397	527	438	416	237	262	250	503	57
MSB073-2	272	377	477	482	402	155	262	209	197	100
MSE192-8rus	238	332	346	480	349	183	258	221	368	151
MSE230-6	360	376	509	501	437	277	324	301	500	106
ND2470-27	197	238	392	415	311	265	328	297	374	290
ND2676-10	331	364	526	416	409	334	294	314	212	251
ND4093-4rus	313	251	393	401	340	269	251	260	278	215
ND5084-3R	460	513	674	391	510	311	361	336	ND	90
W1151rus	231	364	520	441	389	162	190	176	236	51
W1313	313	403	535	491	436	262	249	256	473	62
W1348rus	291	292	604	431	405	243	211	227	547	70
W1355-1	266	435	636	440	444	235	305	270	133	70
WIS75-30	361	385	718	483	487	276	290	283	649	87
Average	316	360	531	435	411	255	272	264	393	150

^{1/} Irrigated

^{2/} Dryland

^{3/} Alberta and Nebraska not included in irrigated sites in average.

North Central Regional Trial Table 2. U.S. No. 1 Yield (cwt/acre) - 1998

Cultivar or Selection	Man	MI	MN	WI	Ave.	ND	OH	Ave	Alb^{1/}	NE
Atlantic	350	344	352	379	356	207	196	202	358	217
Norchip	257	291	401	356	326	268	166	217	492	225
Red Norland	230	286	392	421	332	213	231	222	393	200
Red Pontiac	401	475	587	383	462	233	287	260	207	217
Russet Burbank	230	229	408	413	320	75	112	94	240	64
Russet Norkotah	309	127	502	421	340	255	206	231	482	121
Snowden	290	313	595	298	374	242	209	226	464	172
FV8957-10	247	243	295	375	290	238	209	224	215	226
MN16478	202	159	562	369	323	250	167	209	341	115
MN16966	362	383	716	401	466	249	204	227	555	72
MN 17572	272	287	460	367	347	249	198	224	281	177
MN 17922	255	372	520	426	393	200	212	206	315	87
MSA091-1	270	363	466	374	368	186	176	181	456	49
MSB073-2	222	317	442	441	356	113	181	147	154	79
MSE192-8rus	177	251	292	429	287	137	150	144	259	139
MSE230-6	273	276	442	427	355	209	224	217	402	72
ND2470-27	157	215	368	351	273	237	262	250	333	262
ND2676-10	289	275	475	383	356	275	226	251	175	211
ND4093-4rus	271	129	364	343	277	216	166	191	169	193
ND5084-3R	403	471	633	349	464	294	285	290	ND	79
W1151rus	202	287	497	395	345	131	146	139	163	42
W1313	275	355	479	437	387	219	174	197	420	30
W1348rus	223	146	566	372	327	176	135	156	440	57
W1355-1	162	315	567	377	355	149	198	174	88	59
WIS75-30	285	274	674	418	413	187	191	189	555	66
Average	265	287	482	388	356	208	196	202	331	129

^{1/} Alberta and Nebraska not included in average.

North Central Regional Trial Table 3. Average Percent U.S. No. 1 (over 2" Dia) - 1998

Cultivar or Selection	Man	MI	MN	WI	Ave.	ND	OH	Ave	Alb^{1/}	NE
Atlantic	88	91	87	87	88	90	76	83	92	88
Norchip	90	81	90	90	88	86	67	77	88	90
Red Norland	87	87	94	93	90	83	79	81	89	91
Red Pontiac	82	92	88	92	89	83	62	73	90	86
Russet Burbank	79	65	75	89	77	51	50	51	69	92
Russet Norkotah	87	59	96	94	84	85	75	80	88	85
Snowden	85	86	96	90	89	91	80	86	90	92
FV8957-10	88	85	83	93	87	86	72	79	92	94
MN16478	87	80	96	92	89	90	82	86	88	88
MN16966	86	79	93	91	87	82	65	74	88	77
MN 17572	81	74	91	83	82	83	74	79	81	86
MN 17922	89	96	92	94	93	88	80	84	93	80
MSA091-1	90	91	88	85	89	78	67	73	91	86
MSB073-2	82	84	93	92	88	73	69	71	78	79
MSE192-8rus	74	75	84	89	81	75	58	67	70	92
MSE230-6	76	73	87	85	80	76	69	73	80	68
ND2470-27	80	90	94	85	87	90	80	85	89	90
ND2676-10	87	75	90	92	86	82	77	80	82	84
ND4093-4rus	87	52	93	86	80	80	66	73	61	90
ND5084-3R	88	92	94	89	91	94	79	87	ND	87
W1151rus	87	79	95	89	88	80	77	79	69	82
W1313	88	73	89	89	85	84	70	77	89	80
W1348rus	77	50	94	86	77	72	64	68	80	82
W1355-1	61	73	89	86	77	62	65	64	66	85
WIS75-30	79	71	94	86	83	65	66	66	86	76
Average	83	79	91	89	85	80	71	76	83	86

^{1/} Alberta and Nebraska not included in average.

North Central Regional Trial Table 4. Maturity Classification - 1998^{1/}

Cultivar or Selection	Alb	Man	MI	MN	NE	ND	OH	WI	Ave
Atlantic	3.9	4.0	ND	2.1	2.0	3.5	4.5	4.8	3.5
Norchip	3.4	2.8	ND	2.0	2.0	3.0	4.0	4.6	3.1
Red Norland	2.1	1.0	ND	1.0	1.0	2.3	4.5	1.0	1.8
Red Pontiac	4.5	4.8	ND	1.8	3.0	4.0	4.5	5.0	3.9
Russet Burbank	3.8	3.5	ND	2.0	4.0	4.3	5.0	4.6	3.9
Russet Norkotah	3.0	2.0	ND	1.0	1.5	3.3	3.5	2.7	2.4
Snowden	3.6	3.3	ND	2.8	2.0	3.8	3.5	4.5	3.4
FV8957-10	2.5	2.5	ND	1.3	2.5	3.3	4.0	3.6	2.8
MN16478	3.8	3.3	ND	1.3	2.0	4.0	5.0	4.3	3.4
MN16966	4.3	3.8	ND	2.6	4.0	3.5	4.0	5.0	3.9
MN 17572	2.8	1.3	ND	1.4	2.0	2.8	3.5	3.6	2.5
MN 17922	3.3	3.5	ND	1.5	2.0	3.5	4.5	4.3	3.2
MSA091-1	3.8	4.0	ND	2.4	2.0	3.5	3.5	4.5	3.4
MSB073-2	3.5	4.0	ND	2.5	2.0	3.0	4.0	4.8	3.4
MSE192-8rus	3.0	2.5	ND	1.0	2.5	3.5	4.5	4.5	3.1
MSE230-6	3.8	3.3	ND	2.0	2.5	3.3	4.0	4.6	3.4
ND2470-27	3.1	2.5	ND	1.9	2.5	3.5	4.5	4.5	3.2
ND2676-10	3.3	2.3	ND	1.6	2.0	3.0	3.5	3.6	2.8
ND4093-4rus	2.3	2.3	ND	1.0	2.0	3.3	4.0	1.9	2.4
ND5084-3R	ND	5.0	ND	2.3	4.0	4.0	5.0	5.0	4.2
W1151rus	3.6	4.0	ND	1.0	4.0	3.5	4.5	4.6	3.6
W1313	4.0	3.8	ND	2.4	2.0	3.8	4.5	5.0	3.6
W1348rus	4.6	3.5	ND	2.4	2.5	4.3	4.5	5.0	3.8
W1355-1	3.5	3.8	ND	3.0	2.0	3.8	4.0	4.6	3.5
WIS75-30	4.6	3.5	ND	1.8	2.5	3.8	4.0	4.6	3.5
Average	3.5	3.2	ND	1.8	2.4	3.5	4.2	4.2	

- ^{1/} 1. Very early - Irish Cobbler maturity
2. Early - Norland maturity
3. Medium - Red Pontiac maturity

4. Late - Katahdin maturity
5. Very late - Russet Burbank maturity

North Central Regional Trial Table 5. Specific Gravity - 1998^{1/}

Cultivar or Selection	Alb	Man	MI	MN	NE	ND	OH	WI	Ave
Atlantic	100	105	78	74	95	105	90	80	91
Norchip	89	89	70	71	80	96	85	68	81
Red Norland	74	71	52	53	65	73	68	54	64
Red Pontiac	75	73	55	59	65	80	64	53	66
Russet Burbank	91	84	69	76	75	83	80	72	79
Russet Norkotah	84	84	60	65	75	89	82	61	75
Snowden	96	102	76	81	90	100	90	79	89
FV8957-10	85	86	63	67	85	89	77	64	77
MN16478	104	96	75	83	80	100	87	74	87
MN16966	92	95	72	74	85	103	93	75	86
MN 17572	66	68	52	49	65	77	69	50	62
MN 17922	76	76	56	55	65	78	67	58	66
MSA091-1	96	92	78	80	80	95	89	78	86
MSB073-2	98	96	75	75	90	100	91	80	88
MSE192-8rus	80	81	66	64	75	85	76	63	74
MSE230-6	101	97	78	76	80	103	91	74	88
ND2470-27	85	82	65	62	80	89	76	68	76
ND2676-10	88	90	71	65	80	98	82	65	80
ND4093-4rus	86	83	63	64	80	85	69	64	74
ND5084-3R	ND	67	55	54	65	74	62	51	61
W1151rus	75	73	57	63	75	81	71	58	69
W1313	102	101	87	88	95	104	94	85	95
W1348rus	100	92	70	76	75	99	86	71	84
W1355-1	95	97	80	79	80	102	92	76	88
WIS75-30	98	95	74	76	80	108	89	78	87
Average	89	87	68	69	79	92	81	68	79

^{1/} "88" is abbreviation for a specific gravity value of 1.088

North Central Regional Trial Table 6. Scab Reaction Report - Most Representative Scab (Area/type)^{1/} - 1998

Cultivar or Selection	Alb	Man	MI	MN	NE	ND	OH	WI
Atlantic	ND	T-1	ND	ND	1-4	T-1	0-0	T-5
Norchip	ND	T-1	ND	ND	1-4	T-1	0-0	0-0
Red Norland	ND	T-1	ND	ND	0-0	3-1	0-0	1-1
Red Pontiac	ND	T-1	ND	ND	0-0	3-1	0-0	2-5
Russet Burbank	ND	0-0	ND	ND	0-0	0-0	0-0	T-5
Russet Norkotah	ND	0-0	ND	ND	0-0	0-0	0-0	T-5
Snowden	ND	0-0	ND	ND	0-0	0-0	0-0	T-5
FV8957-10	ND	T-1	ND	ND	1-4	1-2	0-0	T-5
MN16478	ND	0-0	ND	ND	0-0	T-1	0-0	1-2
MN16966	ND	T-1	ND	ND	0-0	T-1	0-0	1-1
MN17572	ND	T-1	ND	ND	0-0	3-1	0-0	1-1
MN17922	ND	T-1	ND	ND	0-0	3-1	0-0	T-1
MSA091-1	ND	T-1	ND	ND	0-0	T-1	0-0	0-0
MSB073-2	ND	T-1	ND	ND	T-4	T-1	0-0	1-5
MSE192-8rus	ND	0-0	ND	ND	0-0	0-0	0-0	0-0
MSE230-6	ND	T-1	ND	ND	1-4	T-1	0-0	T-1
ND2470-27	ND	T-1	ND	ND	1-4	T-1	0-0	T-5
ND2676-10	ND	T-1	ND	ND	0-0	T-1	0-0	T-5
ND4093-4rus	ND	0-0	ND	ND	0-0	0-0	0-0	0-0
ND5084-3R	ND	T-1	ND	ND	0-0	T-1	0-0	1-2
W1151rus	ND	T-1	ND	ND	0-0	2-2	1-2	1-1
W1313	ND	T-2	ND	ND	1-4	T-1	0-0	1-5
W1348rus	ND	0-0	ND	ND	0-0	0-0	0-0	0-0
W1355-1	ND	T-1	ND	ND	0-0	0-0	0-0	T-5
WIS75-30	ND	0-0	ND	ND	1-4	1-2	0-0	1-2

^{1/}

Area

T = less than 1%

1 = 1-20%

2 = 21-40%

3 = 41-60%

4 = 61-80%

5 = 80-100%

Type

1 = Small, superficial

2 = Larger, superficial

3 = Larger, rough pustules

4 = Larger pustules, shallow eyes

5 = Very large pustules, deep holes

North Central Regional Trial Table 7a . Summary of Grade Defects on All Irrigated Sites - 1998.

Cultivar or Selection	Scab ^{2/}	External ^{1/}					Internal ^{1/}			
		Growth Cracks	Off Shape & Second Growth	Tuber Rot	Sun Green	Total Free of External Defects ^{3/}	Hollow Heart	Internal Necrosis	Vascular Discoloration	Total Free of Internal Defects ^{4/}
Atlantic	7.0	1.5	1.0	0.0	1.3	96.2	3.7	5.6	1.4	89.3
Norchip	7.0	1.8	5.0	0.0	2.6	90.6	0.2	2.4	12.0	85.4
Red Norland	8.0	1.8	0.3	0.0	0.0	97.9	1.2	0.2	0.4	98.2
Red Pontiac	19.0	3.0	0.8	0.3	2.5	93.4	2.7	1.2	8.6	87.5
Russet Burbank	0.7	4.0	7.5	0.0	1.2	87.3	5.2	4.2	5.4	85.2
Russet Norkotah	2.0	1.3	3.5	0.0	0.5	94.7	0.8	0.0	5.8	93.4
Snowden	2.7	0.5	2.0	0.0	0.8	96.7	0.2	0.8	6.4	92.6
FV8957-10	19.0	2.5	1.5	0.3	1.8	93.9	5.8	3.8	5.0	85.4
MN16478	1.3	0.5	1.8	0.0	1.0	96.7	0.0	2.6	18.0	79.4
MN16966	8.3	1.0	1.5	0.0	0.5	97.0	0.2	6.4	13.6	79.8
MN17572	7.0	0.8	0.8	0.0	0.0	98.4	1.2	2.2	2.4	94.2
MN17922	3.0	1.3	1.0	0.0	2.2	95.5	0.0	0.0	7.0	93.0
MSA091-1	2.3	1.8	2.5	0.0	3.0	92.7	0.5	8.6	6.6	84.3
MSB073-2	2.3	0.0	0.3	0.0	2.0	97.7	0.2	1.2	5.6	93.0
MSE192-8rus	0.0	2.0	3.5	0.0	0.4	94.1	0.8	1.0	4.0	94.2
MSE230-6	6.0	1.3	4.0	0.0	1.8	92.9	0.2	0.4	2.8	96.6
ND2470-27	10.7	0.3	1.3	0.0	0.8	97.6	0.8	2.6	3.8	92.8
ND2676-10	3.3	0.8	1.3	1.5	1.3	95.1	3.0	5.4	8.8	82.8
ND4093-4rus	0.0	1.8	2.0	0.0	0.5	95.7	1.0	0.2	0.6	98.2
ND5084-3R	5.7	0.0	0.0	0.0	1.5	98.5	0.2	3.8	6.6	89.4
W1151rus	7.3	1.5	1.8	0.0	0.5	96.2	1.7	0.6	11.6	86.1
W1313	16.3	0.3	0.5	0.0	1.6	97.6	0.5	1.4	4.6	93.5
W1348rus	0.0	1.3	4.0	0.0	1.2	93.5	4.2	2.6	1.6	91.6
W1355-1	2.0	0.0	0.8	0.0	2.8	96.4	0.3	1.8	8.6	89.3
WIS75-30	3.0	0.3	1.5	0.0	0.8	97.4	0.0	2.8	1.8	95.4
Average	5.8	1.3	2.0	0.2	1.3	95.2	1.4	2.5	6.1	90.0

^{1/} Based on four 25 tuber samples (one from each replication). Percentage based on number of tubers.

^{2/} Number of tubers with scab of 100 tubers rated. Does not count in external defects.

^{3/} Tubers free from any external defect of any sort.

^{4/} Percentage of normal tubers showing no internal defects. Individual tubers may have more than one type of internal defect.

North Central Regional Trial Table 7b . Summary of Grade Defects on Dryland Sites - 1998.

Cultivar or Selection	Scab ^{2/}	External ^{1/}					Internal ^{1/}			
		Growth Cracks	Off Shape & Second Growth	Tuber Rot	Sun Green	Total Free of External Defects ^{3/}	Hollow Heart	Internal Necrosis	Vascular Discoloration	Total Free of Internal Defects ^{4/}
Atlantic	1.0	3.0	10.0	0.0	9.0	78.0	10.0	8.0	0.0	82.0
Norchip	1.0	2.5	7.0	0.0	3.5	87.0	0.0	2.0	0.0	98.0
Red Norland	8.5	1.0	10.5	0.0	1.5	87.0	2.0	2.0	0.0	96.0
Red Pontiac	3.0	4.0	22.0	0.0	2.5	71.5	4.0	2.0	0.0	94.0
Russet Burbank	0.0	5.0	52.0	0.0	0.0	43.0	0.0	6.0	0.0	94.0
Russet Norkotah	0.0	0.0	12.0	0.0	1.5	86.5	10.0	0.0	0.0	90.0
Snowden	0.0	0.0	0.0	0.0	2.0	98.0	0.0	0.0	6.0	94.0
FV8957-10	6.5	4.0	8.5	0.0	4.0	83.5	4.0	0.0	0.0	96.0
MN16478	3.0	0.0	6.0	0.0	1.5	92.5	2.0	0.0	10.0	88.0
MN16966	9.0	0.5	21.5	0.0	0.5	77.5	0.0	2.5	0.0	98.0
MN17572	3.5	0.0	6.0	0.0	1.5	92.5	0.0	0.0	0.0	98.0
MN17922	4.0	1.5	8.0	0.0	0.0	90.5	0.0	0.0	0.0	100.0
MSA091-1	2.0	3.5	24.0	0.0	3.5	69.0	2.0	0.0	0.0	98.0
MSB073-2	2.5	0.0	0.5	0.0	2.5	97.0	0.0	0.0	0.0	100.0
MSE192-8rus	0.0	11.0	13.0	0.0	0.0	76.0	2.0	0.0	0.0	98.0
MSE230-6	2.5	0.5	19.5	0.0	4.5	75.5	0.0	8.0	0.0	92.0
ND2470-27	5.0	2.5	9.0	0.0	5.5	83.0	0.0	0.0	0.0	100.0
ND2676-10	1.0	0.0	7.0	0.0	7.0	86.0	0.0	0.0	6.0	94.0
ND4093-4rus	0.0	2.5	9.5	0.0	1.5	86.5	22.0	0.0	0.0	78.0
ND5084-3R	1.0	2.0	9.5	0.0	2.5	86.0	0.0	0.0	0.0	100.0
W1151rus	12.5	0.5	8.5	0.0	1.5	89.5	8.0	0.0	0.0	92.0
W1313	1.5	1.5	3.5	0.0	0.5	94.5	6.0	0.0	2.0	92.0
W1348rus	0.0	2.5	8.5	0.5	1.5	87.0	6.0	0.0	0.0	94.0
W1355-1	0.0	0.0	2.5	0.0	1.5	96.0	0.0	0.0	0.0	100.0
WIS75-30	26.5	0.0	2.5	0.5	2.5	94.5	0.0	0.0	0.0	100.0
Average	3.8	2.3	11.2	0.0	2.5	84.0	3.1	1.2	0.7	94.6

^{1/} Based on four 25 tuber samples (one from each replication). Percentage based on number of tubers.

^{2/} Number of tubers with scab of 100 tubers rated. Does not count in external defects.

^{3/} Tubers free from any external defect of any sort.

^{4/} Percentage of normal tubers showing no internal defects. Individual tubers may have more than one type of internal defect.

North Central Regional Trial Table 8a: Hunter and Agron Values of Chipping Entries At (A) Harvest, and Following 3 Months Storage at (B) 42°F and (C) 50°F

A.

Entry	Michigan	Minnesota	Wisconsin	North Dakota	Average	Manitoba	Ohio	Average	Average Across all sites
Atlantic	64	55	60	55	59	51	59	55	57
FV8957-10	61	42	60	58	55	60	62	61	57
MN16478	60	44	no data	no data	52	60	59	60	56
MN16966	55	36	no data	no data	46	46	64	55	50
MSA091-1	65	50	60	61	59	61	59	60	59
MSB073-2	57	46	58	58	55	53	62	58	56
MSE230-6	58	45	54	61	55	66	50	58	56
ND2470-27	62	52	65	65	61	62	55	59	60
ND2676-10	64	57	62	68	63	64	63	64	63
Norchip	62	53	59	62	59	48	61	55	58
Snowden	63	56	64	61	61	64	60	62	61
W1313	63	59	60	59	60	64	64	64	62
W1355-1	61	55	62	61	60	64	62	63	61
WIS75-30	58	54	60	63	59	65	65	65	61

B.

Entry	Michigan	Minnesota	Wisconsin	North Dakota	Average
Atlantic	50	48	50	56	51
FV8957-10	57	45	50	55	52
MN16478	62	45	no data	no data	54
MN16966	58	42	no data	no data	50
MSA091-1	58	50	46	54	52
MSB073-2	48	42	42	53	46
MSE230-6	55	52	50	60	54
ND2470-27	62	48	56	65	58
ND2676-10	62	58	59	61	60
Norchip	58	50	59	59	57
Snowden	61	57	56	63	59
W1313	62	56	54	61	58
W1355-1	61	56	54	60	58
WIS75-30	63	54	58	60	59

C.

Entry	Michigan	Minnesota	Wisconsin	North Dakota	Average
Atlantic	60	51	59	61	58
FV8957-10	65	48	56	63	58
MN16478	61	47	no data	no data	54
MN16966	61	48	no data	no data	55
MSA091-1	64	57	60	64	61
MSB073-2	62	49	52	62	56
MSE230-6	60	55	60	56	58
ND2470-27	63	56	66	63	62
ND2676-10	67	59	62	67	64
Norchip	61	55	60	64	60
Snowden	63	56	63	67	62
W1313	61	64	65	62	63
W1355-1	62	62	62	63	62
WIS75-30	64	56	64	62	62

Hunter values for MI, MN, WI, and ND were provided by the USDA-ARS-NPA Potato Research Worksite at East Grand Forks, MN; Agron Values for Manitoba and Ohio were provided by cooperators at those respective sites.

North Central Regional Trial Table 8b. Chip Color - 1998

Cultivar or Selection	MI ^{1/}	NE	Ave.
Atlantic	1.0	1.0	1.0
Norchip	2.0	1.0	1.5
Red Norland	3.0	2.0	2.5
Red Pontiac	3.0	4.0	3.5
Russet Burbank	1.5	3.0	2.3
Russet Norkotah	2.5	3.0	2.8
Snowden	1.0	1.0	1.0
FV8957-10	1.5	2.0	1.7
MN16478	2.0	3.0	2.5
MN16966	1.0	2.0	1.5
MN 17572	2.0	4.0	3.0
MN 17922	2.0	3.0	2.5
MSA091-1	1.5	3.0	2.3
MSB073-2	2.0	2.0	2.0
MSE192-8Russ	1.5	3.0	2.3
MSE230-6	1.5	2.0	1.8
ND2470-27	1.0	2.0	1.5
ND2676-10	1.0	1.0	1.0
ND4093-4Russ	2.0	3.0	2.5
ND5084-3R	3.0	4.0	3.5
W1151Russ	1.5	2.0	1.8
W1313	1.0	1.0	1.0
W1348Russ	1.5	3.0	2.3
W1355-1	1.0	1.0	1.0
W75-30	1.5	2.0	1.8
Average	1.7	2.3	2.0

^{1/} PCII Color Chart (1 = lightest; 10 = darkest)

North Central Regional Trial Table 9. General Merit Rating Points - 1998

Cultivar or Selection	Alb	Man	MI	MN	NE	ND	OH	WI	Total Points
Atlantic	ND	2	4		5				11
Norchip	ND								0
Red Norland	ND					4			4
Red Pontiac	ND	4			2		5		11
Russet Burbank	ND								0
Russet Norkotah	ND	1		1		3		2	7
Snowden	ND			3					3
FV8957-10	ND					1			1
MN16478	ND								0
MN16966	ND	3							3
MN17572	ND								0
MN17922	ND		5	4		2			11
MSA091-1	ND		1						1
MSB073-2	ND								0
MSE192-8rus	ND		3						3
MSE230-6	ND						1		1
ND2470-27	ND				3		3		6
ND2676-10	ND				4	5	2	5	16
ND4093-4rus	ND				1			4	5
ND5084-3R	ND	5		5			4		14
W1151rus	ND							1	1
W1313	ND		2					3	5
W1348rus	ND								0
W1355-1	ND								0
WIS75-30	ND			2					2

1/	Merit Ratings	Rating	Points	
		1	5	1. ND2676-10 - 16 points
		2	4	2. ND5084-3R - 14 points
		3	3	3. Atlantic - 11 points
		4	2	3. Red Pontiac - 11 points
		5	1	3. M17922 - 11 points
				4. Russet Norkotah - 7 points
				5. ND2470-27 - 6 points

North Central Regional Trial Table 10. Three-year summary of the yield and specific gravity of A. W1151rus and B. ND2676-10 and W1313 relative to check cultivars in the North Central Regional Potato Variety Trial (1996-98).

A.	1996					1997					1998				
	U.S. #1 (cwt/acre)	% U.S. #1	% Total Solids	U.S. #1 (cwt/acre)	% U.S. #1	% Total Solids	U.S. #1 (cwt/acre)	% U.S. #1	% Total Solids	U.S. #1 (cwt/acre)	% U.S. #1	% Total Solids	U.S. #1 (cwt/acre)	% U.S. #1	Average U.S. #1
Variety															
W1151rus	227	83	1.065	208	79	1.067	283	84	1.069	239					
R. Burbank	233	71	1.077	232	67	1.075	299	64	1.079	255					
R. Norkotah	213	79	1.070	228	82	1.068	337	82	1.075	259					

B.	1996					1997					1998				
	U.S. #1 (cwt/acre)	% U.S. #1	% Total Solids	U.S. #1 (cwt/acre)	% U.S. #1	% Total Solids	U.S. #1 (cwt/acre)	% U.S. #1	% Total Solids	U.S. #1 (cwt/acre)	% U.S. #1	% Total Solids	U.S. #1 (cwt/acre)	% U.S. #1	Average U.S. #1
Variety															
ND2676-10	248	85	1.080	251	84	1.074	304	83	1.080	268					
W1313	339	83	1.090	314	86	1.091	292	81	1.095	315					
Norchip	234	81	1.078	234	85	1.075	272	83	1.081	247					
Atlantic	317	91	1.088	259	88	1.082	279	86	1.091	285					
Snowden	282	74	1.083	280	88	1.080	300	88	1.089	287					

SOUTHWEST REGIONAL POTATO VARIETY TRIAL

J.C. Miller¹, Jr., J.W. Koym¹, D.C. Scheuring¹, R.E. Voss², H. Phillips², D. Kirby², D.G. Holm³, J.D. Wick³, and A. Thompson³

This was the first year for the Southwest Regional Trial. It was organized and conducted in four locations by the Southwest Regional Potato Research Group consisting of California, Colorado, and Texas. The objective was to test advanced selections from the Colorado and Texas breeding programs that have shown promise. Entries that are successful in this trial will then be entered in the various Western Regional Trials. The 1998 trial consisted of 15 entries, including the check varieties Red LaSoda, Yukon Gold, Russet Norkotah, and Chipeta. The top five highest yielding selections tested were ATX92230-4Ru, NDTX4930-5W, CO89037-7Ru, ATX9204-4Ru, and AC87138-4. Three selections, AC87079-3, AC87138-4, and CO89036-10 will be advanced to the Western Regional Trial.

Trial locations, cooperators and cultural information are presented in Southwest Table 1. Southwest Table 2 lists descriptions of the clones and varieties. Total yield, total yield of U.S. No. 1s, specific gravity, chipping and fry color data, and a summary from all locations are found in Southwest Tables 3-5.

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Southwest Table 1. Locations, Cooperators, and Cultural Information.

Locations	Cooperators	Irrigation	Fertilization (lb/A)	Harvest method	Dates		
					Plant	Vine kill	Harvest
1. Kern Co. California (KRN)	R. Voss						
	H. Phillips	Sprinkler	175-75-75	Machine	18-Feb		22-Jun
2. Tulelake California (TUL)	R. Voss, H. Phillips	Sprinkler	140-108-108	Machine	21-May	4-Sep	29-Sep
	D. Kirby						103
3. San Luis Valley Colorado (SLV)	D. Holm	Pivot	170-100	Machine	15-May	28-Aug	29-Sep
	A. Thompson						103
4. Springlake Texas (SPR)	C. Miller, J. Koym	Pivot	380-30-30	Hand	29-Mar	15-Jul	3-Aug
	D. Scheuring						106

Southwest Table 2. Description of Clones and Varieties in Southwest Regional Trial, 1998.

Clone / Variety	Female	Male	Flower Color	Vine Size	Maturity	Tuber Shape	Skin Color	Entered By	Use
1. Chipeta	WNC612-13	Wischip	Red-Purple	Large	Med-Late	Round	Buff	Check	Chip
2. Red LaSoda	Triumph	Katahdin	Red-Purple	Medium	Med-Late	Oval	Light Red	Check	Fresh
3. Russet Norkotah	ND9687-5Ru	ND9526-4Ru	White	Small	Early	Long	Russet	Check	Fresh
4. Yukon Gold	Norgleam	W5279-4	Pink	Medium	Early	Oval	White	Check	Specialty
5. AC87079-3Ru	A7979-28	A7816-14	White	Med-Large	Med-Early	Oblong	Russet	CO	Fresh
6. AC87138-4Ru	A81323-6	Russet Norkotah	White	Med-Large	Med-Late	Oblong-Long	Russet	CO	Fry
7. AC89653-3W	NDA2031-2	Spartan Pearl	White	Med-Large	Medium	Round	White	CO	Chip
8. ATX9204-4Ru	A8343-12	A8519-4	White	Medium	Medium	Oblong	Russet	TX	Fresh
9. ATX92230-4Ru	A8603-13	A8495-1	White	Medium	Medium	Oblong	Russet	TX	Fresh
10. CO89036-10Ru	AC83064-6	CO82142-4	White	Med-Large	Medium	Oblong	Russet	CO	Fresh
11. CO89037-7Ru	AC83064-6	Eide Russet	White	Medium	Early	Oblong	Russet	CO	Fry
12. COTX90046-5	AC83064-6	NDO1496-1	White	Medium	Med-Late	Round	White	TX	Chip
13. NDC4655-1R	ND1618-13R	Fontenot	Red-Purple	Medium	Early	Round	Red	CO	Fresh
14. NDTX4930-5W	ND860-2	A7961-1	White	Medium	Medium	Oblong	White	TX	Chip
15. TX1523Ru/Y	Krantz	Delta Gold	White	Medium	Medium	Round-Oblong	Russet	TX	Specialty

Southwest Table 3. Total Yield of Clones in Southwest Regional Trial, 1998.

Clone/Variety	Total Yield (CWT/A)				
	CA		CO		
	KRN	TUL	SLV	SPR	Mean
1. Chipeta	182		591	196	323
2. Red LaSoda	418	395	563	449	456
3. Russet Norkotah	387	391	435	418	408
4. Yukon Gold	441	444	439	422	437
5. AC87079-3Ru	511	590	484	134	430
6. AC87138-4Ru	370	562	504	205	410
7. AC89653-3W	309		611	325	415
8. ATX9204-4Ru	346		498	412	419
9. ATX92230-4Ru	517		484	349	450
10. CO89036-10Ru	449	520	460	271	425
11. CO89037-7Ru	345	282	394	389	353
12. COTX90046-5	325	336	533	379	393
13. NDC4655-1R	206	470	459	210	336
14. NDTX4930-5W	246		544	493	428
15. TX1523Ru/Y	328		388	238	318
Mean	359	443	492	326	405

Southwest Table 4. Total Yield and Percent of U.S. No. 1 (>4 oz) in Southwest Regional Trial, 1998.

Clone/ Variety	CA			CO		TX		Mean	
	KRN	TUL	SLV	SPR					
	CWT/A	%	CWT/A	%	CWT/A	%	CWT/A		
1. Chipeta	146	80			488	83	158	79	264
2. Red LaSoda	277	66	276	70	414	73	397	89	341
3. Russet Norkotah	241	63	313	79	380	87	346	82	320
4. Yukon Gold	355	81	406	91	397	90	392	93	388
5. AC87079-3Ru	333	89	461	78	440	91	95	71	332
6. AC87138-4Ru	207	53	405	72	398	79	123	60	283
7. AC89653-3W	249	81			522	86	235	73	335
8. ATX9204-4Ru	243	69			435	87	379	92	352
9. ATX92230-4Ru	430	83			378	78	275	80	361
10. CO89036-10Ru	399	89	405	78	359	78	202	75	341
11. CO89037-7Ru	298	87	240	85	349	89	360	93	312
12. COTX90046-5	291	88	262	78	353	66	352	93	315
13. NDC4655-1R	177	84	385	74	371	81	172	81	276
14. NDTX4930-5W	170	69			471	86	451	91	364
15. TX1523Ru/Y	308	94			334	86	221	93	288
Mean	275	78	350	78	406	83	277	83	325

Southwest Table 5. Specific Gravity (1.0xx) of Clones in Southwest Regional Trial, 1998.

Clone/ Variety	CA		CO	TX	Mean
	KRN	TUL	SLV	SPR	
1. Chipeta	80		87	57	75
2. Red LaSoda	80	78	69	51	70
3. Russet Norkotah	84		70	59	71
4. Yukon Gold	93	71	83	64	78
5. AC87079-3Ru	88		84	54	75
6. AC87138-4Ru	88		81	52	74
7. AC89653-3W	87		89	69	82
8. ATX9204-4Ru	68		73	64	68
9. ATX92230-4Ru	90		87	58	78
10. CO89036-10Ru	84		75	53	71
11. CO89037-7Ru	97		72	57	75
12. COTX90046-5	87		90	57	78
13. NDC4655-1R	80	83	74	52	72
14. NDTX4930-5W	91		84	65	80
15. TX1523Ru/Y	91		78	64	78
Mean	86	77	80	58	75

Southwest Table 6. Chipping and Fry Data of Clones in Southwest Regional Trial, 1998.

Clone/ Variety	Hunter L Value ¹			Chip Color ²				Fry Color ³		
	CA ⁴	TX ⁴	SPR	TX ⁴	CO ⁵	CO ⁶		CO ⁴	CO ⁷	
	KRN			SPR	SLV	SLV		SLV	SLV	
1. Chipeta			60.5	3	4	4		3		3
2. Red LaSoda								1		2
3. Russet Norkotah								1		3
4. Yukon Gold								1		3
5. AC87079-3Ru								1		3
6. AC87138-4Ru								1		2
7. AC89653-3W	67.9				2.5	3				
8. ATX9204-4Ru								3		4
9. ATX92230-4Ru								1		3
10. CO89036-10Ru								3		4
11. CO89037-7Ru								2		3
12. COTX90046-5		55.5		3	3	3.5				
13. NDC4655-1R								3		4
14. NDTX4930-5W	67.3		64.6	2	2.5	2.5				
15. TX1523Ru/Y								2		2

¹ Higher values reflect the lightest or best chip color.² Chip color was rated using the Snack Food Association 1-5 scale. Ratings ≤ 2.0 are acceptable.³ Fry color was rated on a 0 to 4 scale, with 0 the lightest or best color. Color ratings of ≤ 2.0 are acceptable.⁴ At harvest⁵ 3 weeks at 60° F⁶ 8 weeks at 40° F⁷ 8 weeks at 45° F

Southwest Table 7. Summary Data of Clones in Southwest Regional Trial, 1998.

Clone/Variety	Field Data				Total Yield	Yield Qualities				Tuber Description			
	% Stand	Stems/hill	Vine size ¹	Vine mat. ²		% #1s	% >10	% <4	% Culls	Specific gravity	Tuber shape	Average tuber	Skin color
1. Chipeta	95	5.4	3.2	3.4	323	81	29	11	8	1.075	Round	5.8	Buff
2. Red LaSoda	95	4.5	3.3	2.6	456	75	39	5	14	1.070	Oblong	6.0	Red
3. Russet Norkotah	98	4.2	2.8	2.0	408	78	34	8	7	1.071	Long	6.9	Russet
4. Yukon Gold	89	4.3	3.1	2.2	437	89	47	6	3	1.078	Oblong	7.0	White
5. AC87079-3Ru	97	3.1	3.7	3.0	430	82	23	9	10	1.075	Oblong	3.7	Russet
6. AC87138-4Ru	97	5.2	3.9	3.8	410	66	15	22	9	1.074	Oblong	3.1	Russet
7. AC89653-3W	97	6.1	3.7	3.4	415	80	8	18	3	1.082	Round	3.4	White
8. ATX9204-4Ru	95	3.4	3.9	3.7	419	83	35	7	4	1.068	Oblong	6.6	Russet
9. ATX92230-4Ru	96	3.8	3.7	3.3	450	80	27	6	15	1.078	Oblong	6.1	Russet
10. CO89036-10Ru	96	4.8	4.0	3.4	425	80	12	17	7	1.071	Oblong	3.8	Russet
11. CO89037-7Ru	95	4.0	2.7	2.6	353	89	42	6	4	1.075	Oblong	6.6	Russet
12. COTX90046-5	93	4.4	3.6	3.2	393	81	32	8	13	1.078	Round	6.3	White
13. NDC4655-1R	96	4.2	3.0	2.1	336	80	16	16	3	1.072	Round	3.8	Red
14. NDTX4930-5W	96	5.5	3.2	3.3	428	82	29	7	4	1.080	Oblong	5.8	White
15. TX1523Ru/Y	91	3.5	2.6	1.8	318	91	26	10	1	1.078	Round	6.2	Russet
Mean	95	4.4	3.3	2.9	405	81	27	10	7	1.075		5.4	

¹ 1 = poor, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

² 1 = very early, 2 = early, 3 = medium, 4 = late, 5 = very late

WESTERN REGIONAL POTATO VARIETY TRIAL

J. J. Pavék, D. L. Corsini, and Cooperators

Uniform Potato Yield Trial

The 1998 trial was grown at twelve locations for yield; disease data are from three of the locations. Eighteen entries, 14 experimental, three standard checks, and one early check, were grown. Three locations grew entries for both early and late harvest. The trial locations, dates of planting, vine killing, and harvest, and

days from planting to vine-kill/harvest are shown below. Cultural practices and the use of fertilizer, herbicides, pesticides, and vine killing varied according to local needs. Trial plots at all locations were irrigated on a regular schedule throughout the entire growing season according to plant needs. Spring was wetter than normal in the north, but the rest of the season was hot and dry across the region.

Pavék, Breeder, and Corsini, Pathologist, USDA-ARS, Univ. of Idaho, PO Box AA, Aberdeen, ID 83210. Cooperators: California, R. Voss, H. Phillips; Colorado, D. Holm; Idaho, S. Love; New Mexico, C. Owen, R. Baker; Oregon, A. Mosley, D. Hane, K. Rykbost, C. Shock, S. James; Texas, J.C. Miller, Jr., J. Koym; Washington, R. Thornton, N. Fuller, C. Brown.

The five Russet Norkotah strains, CORN— and TXNS—, scored high for fresh use; testing them is finished. AO87277-6 scored the highest for processing use; it and four others will continue in the trial in 1999; the rest were dropped.

State	Location	Planting Date	Vine-Kill Date	Harvest Date	Days to Vine-Kill/ Harvest
California	Kern Co.	2/18	—	6/22	—/124
"	Tulelake	5/21	9/18	10/5	120/137
Colorado	San Luis Valley	5/15	8/28	9/29	105/137
Idaho	Aberdeen	4/28	9/2	9/21	127/146
"	Kimberly-Early	4/27	8/7	8/10	102/105
"	Kimberly-Late	4/27	9/26	10/1	152/157
New Mexico	Clovis	3/13	—	8/3	—/143
"	Farmington	4/24	—	9/15	—/144
Oregon	Hermiston-Early	3/25	8/3	8/13	131/141
"	Hermiston-Late	4/15	9/21	10/5	159/173
"	Klamath Falls	6/8	9/19	10/7	103/121
"	Malheur	5/4	9/25	10/7	144/156
Texas	Springlake	3/24	7/30	8/9	128/138
Washington	Othello-Early	3/19	—	7/21	—/124
"	Othello-Late	4/30	9/22	10/12	145/165

Western Table 1. 1998 Seed source, stand, tuber and vine characteristics, and foliar and tuber diseases at Aberdeen, ID.^{1/}

Entry	Year in Trial	Seed Source	Stand (7 loc)	Tuber		Vine		Vert.	Early Blight		Common Scab	Net Necrosis		PVY Hrm	Late Blight-MV	
				Shape	Skin	Size	Mat		Fol.	Fol.		KIM	Fol.			
RUSSET BURBANK	-	OR	97	L	RUS	ML	ML	S	S	VR	S	MS	S			
RANGER RUSSET	-	OR	97	L	RUS	M	ML	MR	MS	S	VR	S	S			
RUSSET NORKOTAH	-	OR	98	L	RUS	S	E	VS	VS	R	MR	S	S			
SHEPODY	-	OR	96	O	WHT	M	M	S	VS	S	-	S	S			
AVALANCHE	1	CO	97	OV	WHT	M	M	MR	S	MR	R	VR	S			
A88338-1	1	OR	95	L	RUS	M	M	R	MR	VR	MS	R	S			
AC87084-3	2	CO, OR	94	O	RUS	L	ML	MR	MS	R	MR	MS	S			
AC88042-1	1	CO	93	O	RUS	S	M	S	VS	R	S	R	S			
AC88165-3	1	CO	98	L	RUS	M	ML	S	S	R	MR	MR	S			
AO87277-6	2	OR	95	L	RUS	M	ML	S	S	MS	MR	R	S			
AO89128-4	1	OR	95	L	RUS	L	ML	R	MS	MR	R	MS	S			
CORN-3 ^{2/}	2	OR	94	L	RUS	S	E	S	S	VR	MS	MS	S			
CORN-8 ^{2/}	2	OR	93	L	RUS	S	E	S	VS	VR	MS	MS	S			
NDD840-1	2	CA	92	L	RUS	ML	ML	MR	S	VR	S	-	S			
TX1385-12RU	3	OR	92	O	RUS	ML	M	S	VS	R	MS	MS	S			
TXNS112 ^{2/}	3	OR	95	L	RUS	S	E	S	VS	R	MR	MR	S			
TXNS223 ^{2/}	2	OR	95	L	RUS	S	E	S	VS	R	MR	MR	S			
TXNS278 ^{2/}	3	OR	94	L	RUS	S	E	S	VS	VR	MS	MS	S			

^{1/} Shape: L = long, O = oblong, OV = oval, R = round; Vine size: L = large, ML = medium-large; M = medium, MS = medium-small, S = small;

Mat = maturity, L = late, ML = medium-late, M = medium, ME = medium-early, E = early; Disease reaction: R = resistant, VR = very resistant,

MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible, MV = Mount Vernon.

^{2/} RUSSET NORKOTAH selections.

Western Table 2. 1998 Total tuber yield, cwt/acre; early harvest and late harvest.^{1/}

Entry	Early Harvest							Late Harvest						
	Calif			Texas			Wash	Calif			Idaho			Oregon
	Krn	Kim	NMex	Clv	Hrm	Spr		Tul	Colo	Slv	Ab	Kim	Frm	
							Oth	Mean						
RUSSET BURBANK	371	272	49	645	207	672	433	466	510	396	465	255	695	486
RANGER RUSSET	405	263	48	619	332	613	446	443	478	450	514	386	719	401
RUSSET NORKOTAH	387	253	32	346	274	711	394	391	405	192	326	226	516	434
SHEPODY	-	252	31	587	343	709	473	-	512	-	-	-	-	315
AVALANCHE	-	317	83	766	152	834	517	745	666	362	619	331	1087	523
A88338-1	482	212	41	599	128	641	412	585	-	448	469	330	1034	380
AC87084-3	457	203	32	493	174	603	386	474	556	301	351	139	620	375
AC88042-1	383	267	27	474	339	535	400	476	465	376	393	283	629	417
AC88165-3	410	240	75	600	274	632	431	367	519	407	476	402	708	344
AO87277-6	381	282	46	614	360	679	463	493	-	317	529	343	769	435
AO89128-4	448	240	29	542	291	589	422	326	-	424	511	256	566	416
CORN-3	521	181	40	581	337	709	466	383	537	361	431	324	876	384
CORN-8	394	146	48	430	236	610	363	280	460	244	352	146	599	392
NDD840-1	---	---	---	---	---	---	---	290	-	305	364	268	667	369
TX1385-12RU	276	220	92	522	428	642	418	421	472	356	429	411	845	488
TXNS112	360	251	62	446	286	711	411	296	552	299	392	175	637	383
TXNS223	364	247	38	505	455	649	444	302	538	251	361	188	643	422
TXNS278	445	189	59	430	452	633	430	301	563	290	379	180	716	421
Location Means	358	237	49	541	298	657	406	414	517	340	433	273	725	410
LSD (.05)	99													

^{1/} Krn = Kern. Co., Kim = Kimberly, Clv = Clovis, Hrm = Hermiston, Spr = Springlake, Oth = Othello, Tul = Tulelake, Slv = San Luis Valley, Ab = Aberdeen, Frm = Farmington, Mal = Malheur County.

Western Table 3. 1998 U.S. No. 1's, percent of total yield for locations; overall mean, percent and cwt/acre; early and late harvest.

Entry	Early Harvest										Late Harvest														
	Calif					Oregon					Texas					Wash					Mean				
	Krm	Idaho	NMex	Clv	Hrm	Spr	Oth	Mean		Calif		Colo	Idaho		NMex		Oregon		Wash		Mean				
								%	cwt/A	Tul	Slv		Ab	Kim	Frm	Hrm	Klm	Mal	Oth	%	cwt/A				
RUSSET BURBANK	30	52	3	51	27	52	43	198	66	67	44	52	61	50	67	60	39	56	265						
RANGER RUSSET	76	79	6	87	78	76	79	357	73	88	81	80	86	64	70	82	56	76	366						
RUSSET NORKOTAH	62	66	16	63	84	83	72	290	80	90	64	75	59	74	84	76	73	75	283						
SHEPODY	-	62	0	87	76	81	77	375	-	84	-	-	-	-	79	-	-	-	-						
AVALANCHE	-	69	22	82	57	79	72	397	81	89	75	83	86	67	68	76	74	78	492						
A88338-1	65	79	29	88	83	90	81	339	79	-	83	68	89	62	82	69	51	73	374						
AC87084-3	88	76	21	81	83	78	81	314	89	90	85	85	79	88	68	87	80	83	344						
AC88042-1	70	45	11	58	81	52	61	243	73	75	70	65	71	63	79	70	55	69	302						
AC88165-3	60	56	3	75	58	73	64	289	67	83	71	68	79	57	66	68	73	70	328						
AO87277-6	81	75	4	89	64	83	78	372	76	-	85	79	82	63	85	82	68	78	364						
AO89128-4	66	50	8	68	72	63	64	275	79	-	73	75	47	39	74	70	63	65	282						
CORN-3	43	81	9	87	95	84	78	358	73	89	77	81	83	59	74	86	68	77	346						
CORN-8	47	77	21	81	87	81	75	268	81	90	83	75	69	74	70	81	72	77	282						
NDD840-1	-	-	-	-	-	-	-	-	79	-	78	83	83	78	78	81	54	77	289						
TX1385-12RU	84	80	19	94	81	83	84	355	79	95	88	79	87	63	81	79	67	80	389						
TXNS112	64	85	15	82	86	79	79	324	82	87	78	78	64	73	74	84	70	77	312						
TXNS223	63	74	13	82	82	84	77	348	73	90	75	75	69	73	73	85	73	76	306						
TXNS278	48	81	20	78	88	76	74	317	74	87	82	85	74	68	76	84	71	78	314						
Location means	63	70	13	78	75	76	73	319	77	86	76	76	75	66	75	78	65	74	332						
LSD (.05)	100																			61					

[illegible]

1/ U.S. No. 1's over 3".

Western Table 6. 1998 External and internal defects, french fry color, sugar ends, dextrose, vitamin C, and glycoalkaloids.

U.S. No.2														
Entry	& Culls		Culls <4 oz %	Growth Cracks (7 loc) ^{2/}	Shatter Bruise (5 loc)	Hollow Heart % ^{3/}	Black- Spot (5 loc)	French		Solids		Dextrose YSI % DWB ^{7/}	Vit.C Mg/100g FWB ^{7/}	Glyco- alkaloids mg/100FWB ^{7/}
	>4 oz %	^{1/}						Fry Color ^{5/}	Oven Dry % ^{6/}					
RUSSET BURBANK	29		17	3.4	4.5	11	4.1	1.6		21	0.10	21.9	7.7	
RANGER RUSSET	17		8	4.6	4.8	1	4.1	1.7		23	0.12	33.8	5.8	
RUSSET NORKOTAH	6		19	4.9	4.7	4	4.2	1.4		20	0.13	23.1	4.0	
SHEPODY	-		-	4.8	5.0	1	4.9	3		20	-	-	-	
AVALANCHE	11		12	4.9	4.7	0	4.6	1.7		21	0.21	26.4	3.2	
A88338-1	22		7	4.6	4.5	5	4.6	1.5		23	0.14	21.3	6.0	
AC87084-3	5		10	4.6	4.2	12	3.7	2.2		21	0.13	25.5	6.0	
AC88042-1	8		23	5.0	4.8	0	4.3	1.4		23	0.09	23.1	8.3	
AC88165-3	10		20	4.6	4.6	0	4.1	1.9		23	0.11	30.8	10.3	
AO87277-6	11		12	4.9	4.5	1	4.3	0.6		24	0.05	30.5	8.2	
AO89128-4	15		21	4.6	4.3	5	4.5	0.7		20	0.05	21.6	5.1	
CORN-3	17		8	4.7	4.7	11	4.3	2.5		21	0.20	19.9	3.8	
CORN-8	11		11	4.8	4.7	8	4.3	2.6		23	0.17	22.0	5.5	
NDD840-1	8		15	4.7	3.7	5	3.7	1.9		21	0.21	23.6	8.8	
TX1385-12RU	14		7	4.8	4.0	6	4.1	0.9		21	0.04	19.2	6.0	
TXNS112	11		12	4.7	4.8	5	4.3	2.4		20	0.17	22.6	4.4	
TXNS223	14		11	4.8	4.8	9	4.3	2.4		21	0.17	21.9	3.8	
TXNS278	12		10	4.8	4.7	8	4.3	2.5		22	0.14	24.3	4.5	
Means	13		13	4.7	4.5	5	4.3	1.9		21	0.13	24.2	6.0	
^{1/} Firm omitted. Late Harvest, eight locations. ^{2/} 5.0 (none) to 1.0 (severe).														

^{1/} Firm omitted. Late Harvest, eight locations. ^{2/} 5.0 (none) to 1.0 (severe).

^{3/} Mean of 10 locations including Early Harvest, >12 oz. tubers; includes brown center.

^{4/} Mean of 8 locations, (6 loc. for Shepody and NDD840-1), 1.0 (darkest) to 5.0 (lightest).

^{5/} Mean of 5 locations (Slv, Ab, Hrm, Kim, Klm), out of 45 F storage, <1.0 (lightest) to 4.0 (darkest).

^{6/} Mean for Aberdeen.

^{7/} Aberdeen tubers only, sampled late October; DWB = dry weight basis; FWB = fresh weight basis; Lenape check: 29.5 mg.

Western Table 7. 1998 Merit scores, processing and fresh market, and disposition.

Entry	Merit Score: Processing ^{1/}				Merit Scores: Fresh Market ^{1/}					
	Idaho ^{2/}		Oregon		Calif ^{2/}		Idaho ^{2/}		Oregon	
	SLV	Mean	Hrm	Mean	Krm	Tul	SLV	Mean	Hrm	Mean
				E						
RUSSET BURBANK	3.0	2.8	1.0	2.1	1.0	3.0	3.0	2.0	1.0	1.9
RANGER RUSSET	2.0	4.2	5.0	3.5	2.0	2.0	4.0	3.3	4.5	2.9
RUSSET NORKOTAH	3.0	1.4	2.0	1.8	3.0	4.8	3.0	2.8	2.0	3.2
SHEPODY	2.0	-	4.5	3.3	-	-	4.0	2.8	1.0	2.6
AVALANCHE	1.0	1.8	1.0	1.3	-	3.9	5.0	2.9	1.0	2.8
A88338-1	-	4.1	3.5	3.7	2.0	2.2	-	2.8	3.0	2.5
AC87084-3	3.0	2.7	2.0	2.6	4.0	2.7	5.0	3.4	2.0	3.4
AC88042-1	3.0	3.1	3.0	3.1	2.0	3.8	3.0	2.6	2.0	2.7
AC88165-3	2.0	3.4	3.0	2.4	2.0	2.2	4.0	2.9	3.0	2.6
AO87277-6	-	4.4	4.5	4.2	3.0	2.2	-	3.4	4.0	3.0
AO89128-4	-	4.1	3.0	3.1	3.0	3.8	-	2.6	2.5	2.6
CORN-3	3.0	2.1	2.5	2.2	2.0	3.2	5.0	2.9	5.0	3.4
CORN-8	2.0	2.0	2.5	1.9	3.0	3.2	4.0	3.2	5.0	3.7
NDD840-1	-	3.3	-	2.5	-	2.1	-	3.1	-	2.4
TX1385-12RU	4.0	3.2	1.0	2.5	2.0	2.0	4.0	2.0	1.0	2.0
TXNS112	3.0	2.1	2.5	2.1	2.0	2.0	5.0	3.7	5.0	3.7
TXNS223	3.0	2.3	2.5	2.2	3.0	3.1	5.0	3.1	5.0	3.8
TXNS278	1.0	2.0	2.5	1.7	2.0	4.0	5.0	3.7	5.0	3.8
Means	2.5		2.7	2.6	2.4	3.0	4.2	3.0	3.1	2.9

^{1/} 1.0 (poorest) to 5.0 (best).

^{2/} Composite scores for Ab & Kim.

^{3/} RTC = regional testing completed (3 yrs), CONT = continue in trial, DROP = drop from trial, CHECK = control.

COLORADO

D. G. Holm and F. G. Popiel¹

Objectives

The major objectives of the Colorado breeding program are: (1) to develop new potato cultivars (russets, chippers, reds, and specialty) with increased yield, improved processing and fresh market quality, resistance to diseases and pests, and tolerance to environmental stresses; (2) to provide a basic seed source of selections to growers for seed increase and commercial testing; and (3) to evaluate promising selections for potential seed export (interstate and international).

Breeding Program

Fifty-five parental clones were intercrossed in 1998. Seeds from 375 combinations were obtained. Seedlings from selected families will be produced in 1999 for initial field selection in 2000.

One hundred twenty 1997 seedling families were grown in the greenhouse producing 50,926 seedling tubers in 1998. A second, smaller planting of seedlings representing another 50 families was grown in early 1999 resulting in about 10,500 seedling tubers. These crosses emphasized specialty types. All of these seedlings tubers will be planted for initial field selection in 1999.

Surplus tubers (second thru forth sizes) will be distributed to Idaho, Minnesota, Oregon, Texas, and Alberta, Canada.

Additional seedling tubers were obtained from Dr. J. J. Pavsek, USDA-ARS, Aberdeen, Idaho; Dr. Dermot Lynch, Agriculture Canada, Lethbridge, Alberta; and Dr. J. Creighton Miller, Texas A&M University, College Station, Texas.

Selection Program

A total of 74,517 first-year seedlings were planted with 826 being selected at harvest for further observation. Another 1,048 clones were in 12-hill, preliminary, and intermediate stages of selection. Of these, 270 were saved at harvest for further evaluation. Thirty advanced selections were saved and contingent on additional evaluations, will be increased in 1999. Another 181 selections were maintained for germplasm development, breeding,

other experimental purposes, or seed increases for the Texas program.

Advanced Selections. Table 1 summarizes comparative data for advanced selections undergoing regional and/or grower evaluations.

There were six advanced selections entered in the inaugural Southwest Regional Trial in 1998. Included were four russets (AC87079-3, AC87138-4, CO89036-10, and CO89037-7), one chipper (AC89653-3), and one red (NDC4655-1). With the exception of selection CO89037-7, all of these selections will be advanced to Western Regional Trials in 1999.

Five selections were entered in the Western Regional Main Trial. Included were russet selections AC87084-3, AC88042-1, AC88165-3, Russet Norkotah Selection 3 and Russet Norkotah Selection 8. Selection AC87084-3 will be entered for a third year in 1999. Selections AC88042-1 and AC88165-3 were discarded based on overall performance in 1998. Plant Variety Protection was applied for on both Russet Norkotah selections.

Chipping selection AC87340-2 was entered in the Western Regional Chip Trial. It will be entered for a second year in 1999.

Red selections CO89097-2 and DT6063-1R were entered in the Western Regional Red Trial. DT6063-1R graduated from the trial in 1998 after three years of evaluation. CO89097-2 will be entered for a second year in 1999.

Other more advanced selections that have graduated from regional trials and continue to undergo evaluation include three russets (AC83064-1, AC83064-6, and CO85026-4), one chipper (BC0894-2), and one red (CO86218-2).

Advanced Selections to be Named. Colorado plans to name AC83064-1 (Keystone Russet), AC83064-6 (Silverton Russet) and DT6063-1R (Cherry Red) in 1999.

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Colorado Table 1. Summary comparison of advanced selections and named cultivars for yield, grade, maturity, specific gravity, and grade defects - 1998.

Clone	Usage ¹	Loc x Years	Total Yield (Cwt/A)	% US #1	Vine Maturity ²	Specific Gravity	% External Defects ³	% Hollow Heart ⁴
Russets								
AC83064-1	FM	10	469	88.5	3.2	1.078	1.5	0.0
AC83064-6	FM/Fry	10	392	86.0	3.0	1.080	1.1	0.3
CO85026-4	FM	8	372	89.1	3.7	1.082	3.8	0.0
AC87084-3	FM/Fry	6	520	90.7	3.5	1.091	2.2	0.1
AC87079-3	FM	4	443	84.7	2.7	1.089	2.0	1.4
AC87138-4	FM/Fry	4	504	82.6	3.3	1.086	3.5	0.6
CO89036-10	FM	4	458	80.8	3.3	1.082	4.0	0.0
Centennial Russet	FM	35	294	77.4	3.0	1.078	0.8	0.3
Russet Norkotah	FM	25	324	84.6	1.6	1.075	1.9	0.3
Russet Nugget	FM/Fry	28	416	81.6	3.9	1.092	1.7	0.2
Chippers								
BC0894-2	Chip	7	402	84.7	2.0	1.079	0.8	0.0
AC87340-2	Chip	4	478	80.8	3.4	1.080	0.7	0.4
Atlantic	Chip	12	424	87.7	3.3	1.095	2.0	3.4
Chipeta	Chip	13	492	84.8	3.4	1.088	3.9	0.3
Reds								
CO86218-2	FM	7	406	82.2	3.0	1.076	1.3	0.0
DT6063-1R	FM	5	461	87.8	2.8	1.081	3.0	0.4
CO89097-2	FM	4	508	84.2	2.9	1.079	2.3	0.1
Sangre	FM	16	446	85.6	2.8	1.072	1.2	0.4

¹FM=fresh market; Fry=french fry; FM/Fry indicates a dual purpose clone.

²Vine maturity: 1=very early; 2=early; 3=medium; 4=late; 5=very late.

³Includes defects such as second growth, growth crack, misshapen, and green.

⁴Based on tubers greater than 10 ounces.

Florida

D. P. Weingartner and J. M. White

U of Florida, REC-Hastings and CFREC-Sanford

were among the highest recorded at this location. High levels of late blight infection were observed, but were controlled with the spray program. Plant stand equaled or exceeded 93%.

Introduction: Potato variety trials were conducted at the REC-Hastings farm to evaluate varieties for chipping, fresh market, speciality markets, and resistance to corky ringspot and late blight. There were 249 entries, including standards in 8 tests. Twenty-one round white and four red-skinned varieties and lines were evaluated as part of the NE184 Regional Project for chipping and fresh markets.

Methods: Single-row plots, 15 feet long with three foot breaks, were utilized for the NE184 trial. Twenty-two seed pieces were hand spaced at 8-inch intervals. A randomized complete block design with four replications was used. A summer cover crop of sudax-sudan grass was chopped and then disked several times. Fumigation using 6.0 gallons per acre of Telone II, Lexon DF at 1.25 pounds per acre, seepage irrigation, 1200 pounds per acre of 14-2-12 fertilizer, and 20 pounds per acre of Temik 15G at planting were other standard cultural practices used to grow potatoes. The planting date was February 26 and plots were harvested 104 days later on June 10, 1998. A side-dressing of 700 pounds per acre of 14-2-12 was made when the plants were between 4 to 6 inches high. Nine applications of fungicides and two applications of Dipel (insecticide) were applied from April 6 through May 26. Vines were killed on June 2. Harvesting, washing, and sizing were done by machine, with pick-outs and grading done by hand.

Results: Rainfall for February and March was about twice the normal amount (11.7 vs 5.8 inches). However, rainfall during April, May, and June was less than one-fifth the normal amount (1.7 vs 9.6 inches). Plant growth was generally very vigorous due to warm temperatures and irrigation. Yields

Florida Table 1. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for varieties grown at Hastings, Florida - 1998.
(NE184 Regional Potato Variety Trials)

Variety	%											
	Yield (cwt/A)		Market yield	Size Distribution by Classes ² (%)					1 7/8 to 4"	2 1/2 to 4"	Spec. Grav.	
	Total	Market ¹		1	2	3	4	5				
Round:												
Atlantic (std)	441	372	100	4	37	31	17	11	85	48	1.076	
Itasca	398	319	86	5	50	23	8	14	81	31	1.065	
Katahdin	436	337	91	4	33	33	11	19	77	44	1.062	
Kennebec	390	318	85	4	43	35	3	15	81	38	1.061	
MaineChip	303	213	57	16	66	4	0	14	70	4	1.086	
Monona	373	304	82	3	45	30	6	16	81	36	1.060	
Niska	396	270	73	4	45	21	2	28	68	23	1.069	
Russet Norkotah	344	264	71	6	62	13	1	18	76	14	1.067	
Shepody	304	231	62	7	49	26	2	16	77	28	1.074	
Snowden	436	382	103	4	48	30	10	8	88	40	1.073	
Superior	352	311	84	3	74	14	0	9	88	14	1.072	
Yukon Gold	358	260	70	4	39	33	1	23	73	34	1.069	
A84180-8	298	191	51	25	63	1	0	11	64	1	1.060	
A86102-6	373	257	69	12	65	4	0	19	69	4	1.064	
AF1437-1	380	253	68	3	39	24	4	31	67	28	1.056	
AF1615-1	425	346	93	10	62	18	1	9	81	19	1.065	
B0564-8	379	285	77	8	46	26	4	16	76	30	1.071	
B0766-3	345	302	81	2	33	41	14	10	88	15	1.072	
NY103	376	288	77	5	52	21	4	18	77	25	1.066	
Russet Norkotah #3	309	254	68	4	54	27	1	14	82	28	1.063	
Russet Norkotah #8	363	264	71	5	50	19	3	23	72	22	1.062	

Florida Table 1. Continued

Variety	Yield (cwt/A)		Market yield	Size Distribution by Classes ² (%)					1 7/8 to 4"	2 1/2 to 4"	Spec. Grav.
	Total	Market ¹		1 2 3 4 5							
				1	2	3	4	5			
<i>Red:</i>											
Chieftain (std)	389	294	100	4	46	30	0	20	76	30	1.058
NorDonna	385	302	103	6	60	16	2	16	78	18	1.058
Norland DK	375	228	77	3	40	20	1	36	61	21	1.057
B0811-13	352	259	88	7	55	19	0	19	74	19	1.069
W. Duncan LSD	54	50							7	12	.004

¹Market yield = yield 1 7/8 to 4" excluding external defects.²Size classes: 1 = <1 7/8"; 2 = 1 7/8 to 2 1/2"; 3 = 2 1/2 to 3"; 4 = >3"; 5 = pick outs (rots, cracked, etc. not sized).

Florida Table 2. Plant maturity at vine kill, tuber color, texture, shape, eye depth, and appearance for varieties grown at Hastings, Florida - 1998. (NE184 Regional Potato Variety Trials)

Variety	Plant maturity ¹	Tuber quality ratings ²				
		Color	Texture	Shape	Eye depth	Appearance
Round:						
Atlantic	3.0	6.0	6.0	2.5	5.0	5.5
Itasca	3.8	7.0	7.5	3.0	5.5	3.5
Katahdin	4.0	7.5	8.0	3.0	4.5	7.0
Kennebec	2.0	7.5	7.5	4.5	4.5	5.5
MaineChip	5.0	8.0	8.0	2.0	4.5	6.5
Monona	4.0	8.5	7.0	4.0	4.0	6.5
Niska	4.3	7.5	8.0	3.0	4.0	5.5
Russet Norkotah	5.3	5.0	2.0	6.5	5.5	7.0
Shepody	3.5	8.0	7.5	6.0	6.5	7.0
Snowden	3.0	6.5	4.5	3.0	4.0	5.5
Superior	5.0	6.8	6.0	3.0	5.0	5.5
Yukon Gold	8.8	8.0	7.5	5.5	5.5	4.5
A84180-8	2.5	5.0	2.0	7.0	5.5	6.0
A86102-6	3.3	5.0	2.0	7.0	6.0	4.5
AF1437-1	6.8	7.0	6.0	3.5	4.5	5.5
AF1615-1	3.3	7.5	6.5	2.5	5.5	7.0
B0564-8	4.8	8.0	5.5	2.0	6.0	7.0
B0766-3	2.8	6.5	5.0	2.5	4.5	5.0
NY103	4.8	7.5	6.5	4.5	5.5	7.0
Russet Norkotah #3	2.0	5.0	2.5	7.0	6.0	5.5
Russet Norkotah #8	3.5	5.0	2.5	7.0	6.5	5.0
Red:						
Chieftain	3.8	2.0	6.5	3.5	2.5	5.0
NorDonna	6.5	2.0	6.5	3.0	3.0	7.0
Norland DR	8.8	2.0	6.5	3.0	3.0	7.0
B0811-13	5.8	2.0	5.0	2.5	3.0	6.0

¹Days from planting to harvest = 104; Plant maturity at vine kill.

²Tuber quality ratings: Standard NE184 rating codes for plant and tuber characteristics.

Idaho

S. Love, J. Pavcek, D. Corsini, P. Bain, M. Ruby, J. Stimpson, D. Inglis, and A. Mosley

Evaluations on breeding selections in 1998 included variety trials, herbicide screening, culinary tests, and disease screening. Market types included in the evaluations were long russets (or white processing types), chippers, and reds.

Replicated Variety Trials

Ten potato variety trials were conducted in 1998 in farmers fields at Rexburg and Shelley, and Experiment Station sites at Aberdeen, Kimberly and Parma, Idaho (Idaho Tables 1-10). Rexburg is located in the high elevation area of eastern Idaho and has the coolest, shortest season (120 days between potato planting and harvest) of the four sites. Shelley and Aberdeen are located along the Snake River in eastern Idaho, are slightly warmer, and have growing season of approximately 130 days. Kimberly is located in south-central Idaho and has a 140 day growing season for potatoes. Parma is located in the warmer area of western Idaho and has a 160 day season. All trial sites were located within major potato producing areas.

The trials were planted between April 9 and May 19 and harvested between September 14 and October 6. Crop management practices were typical of those used in the region in which the trial was located. All trials were planted using a randomized complete block design with either four or six replications. Plots consisted of single rows, twenty feet long.

Following harvest, tubers were weighed, graded, and sampled for internal quality evaluations. Depending on the specific objectives of the trial, samples were taken for evaluation of blackspot and shatter bruise susceptibility, presence of internal defects, specific gravity, french fry color, and dry-matter yield.

1998 was an environmentally unusual year in that spring was exceptionally cool and wet. This was followed by a rapid transition into unusually hot, dry weather that persisted through July and August. The result was stressful growing conditions that caused many stress-related quality problems in most trials. Most common were hollow heart, sugar ends, and low specific gravity.

Six of the ten trials were conducted to evaluate dual purpose russet or long-white, processing selections (Idaho Tables 1-6). Two were conducted to evaluate chipping selections (Idaho Tables 7,8), and two to evaluate selections for high dry-matter yield with intent to identify clones superior for dehydration purposes (Idaho Tables 9,10).

The trials grown in Rexburg and Shelley included the most advanced russet breeding selections from the Aberdeen program (Idaho Tables 1,2). At Rexburg, Russet Burbank suffered severely from the stressful summer conditions and produced both low yield and low percentage of U.S. No. 1's. Only Russet Norkotah produced a lower total yield. Except for A82360-7, Ranger Russet had the highest total and No. 1 yield of all entries in the trial. Yield of the other unreleased selections were between Ranger Russet and Russet Burbank. All of the unreleased selections in the trials had acceptable specific gravity, while Russet Burbank, Russet Norkotah, and the Russet Norkotah selections (CORN-3 and CORN-8) did not. A8495-1 (Gem Russet) had the best fry color of the entries in the trial. Overall yields for the Shelley trial were higher than those found at Rexburg, but the relative ranking among entries was similar for most characteristics.

The trial at Parma was designed to provide information on processing quality of advanced selections under the stressful growing conditions of western Idaho (Idaho Table 3). All of the entries had acceptable yields at Parma. Russet Burbank, Ranger Russet, Shepody, and AO82611-7 (Umatilla Russet) showed an abundance of stress related tuber defects, causing a low percentage of U.S. No. 1 potatoes. The other entries were more resistant to the stress conditions. Shepody had very low specific gravity, while A81473-2 (Bannock Russet), A82360-7, and A84118-3 had acceptable levels.

The Tri-state trial represents the stage of evaluation beyond the advanced yield trials and includes locations in Oregon and Washington. In the Idaho location of this trial, all unreleased selections except AO90014-1 and FR43 (a genetically altered Shepody clone) tended to outperform Russet Burbank for both yield and quality (Idaho Table 4).

Advanced russet selections, including fourteen clones in their fifth to ninth year of evaluation, were grown at Aberdeen and Kimberly (Idaho Tables 5,6). A88338-1, A89384-10, and A92158-3 had a

combination of high yield and good internal quality. The clone A90586-11 is a long white with a high level of late blight resistance. It produced high yields and acceptable quality at both locations.

In the Idaho location of the Western Regional chipping trial, all of the unreleased selections had higher yields and better chip color scores than the standard varieties (Idaho Table 7). AC87430-3 had lower specific gravity than all entries except Chipeta. A88431-1 had a tendency for shatter bruise.

In the advanced selection chipping trial Chipeta yielded more than all unreleased selections, while Snowden yielded less than all but one (Idaho Table 8). NDO1496-1, A91790-13, and NDA5705 had a combination of acceptable specific gravity and the ability to chip well directly from 40°F storage.

Every clone tested in the advanced high dry matter trials, except Bzura at Aberdeen and A92408-11 at Kimberly, produced a higher yield of dry matter than did Russet Burbank (Idaho Tables 9,10). The superior dry matter yields were the result of a combination of high tuber yield and high tuber solids. The best selections at both locations were A92294-6 and A92644-2. A82360-7, the best performer the past several years, did not produce significantly higher dry matter yields than Russet Burbank in 1998.

Sensory Evaluations

Five advanced breeding selections were compared to Russet Burbank in blind sensory evaluations of baked tubers. The evaluations were conducted by University of Idaho personnel, located at the Bingham County Extension Office. Tubers were baked in a convection oven, then rated by trained panelists for color, texture, flavor, and overall quality. The evaluations were done twice, once within a month of harvest and again after five months of storage at 40°F.

In the fall evaluation, A84118-3 was rated superior to Russet Burbank for color, flavor and overall quality (Idaho Table 11). Bannock Russet was rated inferior for color. The other three selections were also rated superior for color but similar for other traits. In the spring test, A8893-1 was rated superior to Russet Burbank for color and similar for other traits. The remaining selections were statistically

similar to Russet Burbank. Overall, this group of selections was more similar to Russet Burbank for sensory quality than any tested in the past.

Metribuzin Screening

Eight varieties and twenty-eight breeding selections (mainly those entered into northwest and western regional variety trials) were tested for response to the herbicide metribuzin (Secor/Lexone). Estimations were made for percent foliar injury and measurements taken for vigor following a post-emergence (8-10 inch plants) application of metribuzin at the rate of 1.0 lb a.i./A. This rate is slightly above the highest rate allowed by the label. Yield loss for each clone, as a result of the application, was predicted using a model that incorporates injury and vigor as inputs. Each variety or selection was assigned a relative resistance score based on yield loss in comparison with varieties of known response.

Shepody, as expected, was very susceptible with some plants in each plot dying as a result of injury (Idaho Table 12). Atlantic also showed a susceptible response. Russet Burbank was resistant to injury and Russet Norkotah moderately resistant. Most of the russet and long-white selections were moderately resistant to very resistant to injury. One exception was the selection AC87084-3 from Colorado which showed an 89% yield loss due to injury.

The chipping and round white selections showed a mixed response. Avalance, a European variety was very susceptible to injury. AC87340-3 and AO91812-2 were moderately susceptible.

Of the red clones, A79543-4R, CO89097-2, COO86107-1R, NDO2438-6R, NDO2686-4R, and NDO4592-3R were susceptible or moderately susceptible to injury. The red skinned-red-fleshed selection NDC4069-4R/R was the most susceptible clone in the trial, with every treated plant being killed as a result of the metribuzin application.

Disease Screening

Potato varieties and selections were evaluated for response to several important diseases, including Verticillium wilt, early blight, common scab, soft rot, and late blight.

Verticillium wilt, early blight, common scab, and soft rot: Breeding selections and standard cultivars were evaluated for their reaction to diseases that commonly occur in Idaho. Verticillium wilt, early blight, and common scab evaluations were done in fields at the University of Idaho Research Center, Aberdeen. Trials were grown in two fields as randomized complete blocks with three replications. Natural soil-borne inoculum of *V. dahliae* occurred at both sites, and early blight spreader rows of Pioneer were interplanted with plots at one site. It is expected that early blight symptoms would have been more severe if contact fungicides for late blight control had not been used. No late blight occurred in the plots. The growing season was unusually cool and wet through June and unusually hot and dry in July and August. Soft rot evaluations were done by inoculating tuber samples harvested from one of the test sites in mid-September using 10^6 cells/ml *Erwinia carotovora* var. *atroseptica*. Tubers were evaluated after 5 days incubation in a mist chamber at 20°C. The least significant difference test was used to separate means.

Advanced selections A88338-1, A90467-14, A90586-11, A82360-7, and the variety Chipeta showed the best Verticillium and early blight resistance of all clones tested. Ranger Russet, Shepody, AC87340-3, and A90586-II showed some susceptibility to common scab. AO87277-6, AO90014-1, and FR43 (a genetically altered Shepody clone) were the most resistant to soft rot.

Late blight: Arrangements were made to screen breeding material for late blight resistance in Corvallis, Oregon, and Mt. Vernon, Washington. The trials were conducted by Al Mosley and Debra Inglis, respectively.

In both locations artificial inoculations were used to augment natural infection. Disease response was measured by monitoring disease progress and either calculating Area Under the Disease Progress Curve (AUDPC) or estimating percent defoliation. At both locations the amount of tuber rot was documented.

A wide range of responses to late blight was found among the clones screened (Idaho Tables 14,15). All of the included named varieties commonly grown in North America were susceptible to foliar blight at both locations. At Mt. Vernon, two named varieties had some resistance: Bzura and Brador (Idaho Table 14). Other clones with good resistance were

A90586-II, AWN86514-I, and a series of 1995 Aberdeen crosses made using one or more resistant parents. In Corvallis the trial included mostly clones which were a part of the northwest and western regional trials. Only the clones A88338-I, AC87084-3, and A88421-1 showed an appreciable amount of resistance to foliar blight.

Very little tuber blight occurred at Mt. Vernon. Only the clones A88431-I, AC88165-3, Brador, and A95020-92 showed appreciable amounts of tuber rot. In contrast, a high level of tuber rot occurred at Corvallis. Only the clones AO90014-I, AO90319-I, COO86107-1R, NDO2438-6, NDO4588, NDO2686-6R, and Atlantic had 5% or less tuber rot.

Summary of Promising Breeding Selections

A81473-2: This selection is being released as Bonnock Russet. It is an oblong russet with a very late and disease resistant vine. It is the result of a cross between A75175-1 (Targhee x A67490-3) and A75188-3. A81473-2 was grown at Rexburg, Shelley, and Parma in 1998 (Idaho Tables 1,2,3). In each case, it performed very well for yield and quality in comparison with Russet Burbank. It was included in the baked potato sensory panel, where it was shown to be largely indistinguishable from Russet Burbank.

A82360-7: This oval, lightly russeted clone was developed specifically for dehydration purposes and selected for maximum dry matter yield. It is the result of a cross between A77182-1 (Atlantic x Lemhi Russet) and A75188-3. A82360-7 has shown potential for french fry production as well as dehydration, although its short shape may limit its potential for this market. It was the highest yielding clone in the Rexburg, Shelley, and Parma trials (Idaho Tables 1,2,3). It also showed the potential to maintain acceptable specific gravity and fry color under the stressful 1998 growing conditions. In the high dry-matter trials at Aberdeen and Kimberly, it did not perform as well as in past years for dry-matter production (Idaho Tables 9,10). This clone is currently being evaluated in commercial production trials.

A82705-1R: This dark red clone is currently being released as IdaRose. It is high yielding and has good storage characteristics. It is one of the few selections tested that competes for yield in Idaho with Red LaSoda. It is the result of a cross between Sangre

and TXA218-7 (NDTX9580-6R x Viking). It was included in the Shelley trial in 1998 where it produced outstanding yields and very attractive tubers.

A8495-1: This clone is currently being released as Gem Russet. It has long tubers that are moderately russeted and is very similar in appearance to Russet Norkotah. It is the result of a cross between A77182-1 (Atlantic x Lemhi Russet) and Russet Norkotah. In 1998 it was included in trials at Rexburg and Shelley (Idaho Tables 1,2). Although it tended to produce more small tubers than usual, it out-performed Russet Burbank in nearly every yield and quality category. In spite of the hot weather, it produced excellent specific gravity and showed the best potential for making acceptable french fries following cold storage of any of the russet type clones. A8495-1 has shown itself to be a PVY carrier.

A84118-3: This long, russet clone is the result of a cross between A77236-6 and TND329-1Russ. It has excellent tuber type and appearance. In past years it has produced only moderate yields, but a high percentage of marketable tubers. In 1998, it was included in the Rexburg, Shelley, and Parma trials (Idaho Tables 1,2,3). In each case, it out-yielded Russet Burbank and showed the ability to produce tubers with excellent internal quality. In the sensory panel it was equal to or superior to Russet Burbank for baked quality (Idaho Table 11). In past years this clone has shown moderate levels resistance to foliar late blight, and high levels of resistance to tuber blight.

A90586-11: This clone came out of the late blight resistance breeding efforts. It is a cross between the Polish seedling KSA195-90 (PG-429 x Duet) and Ranger Russet. It has long shape and white skin. In 1998 it was grown in trials at Aberdeen and Kimberly (Idaho Tables 5,6). It showed excellent yield potential and high specific gravity. Although its fry color from storage was slightly darker than that of Russet Burbank, it was in the acceptable range. It showed some potential susceptibility to blackspot bruise. In the Mt. Vernon late blight tests, it was among the best clones for resistance to both foliar and tuber late blight (Idaho Table 14).

NDO1496-1: This round, white chipping clone is an Oregon selection of a North Dakota seedling. It is the result of a cross between ND292-1 and A77268-1

(Lemhi Russet x Norchip). Due to susceptibility to shatter bruise, Oregon researchers dropped NDO1496-1, and it is now being evaluated by the Idaho industry. In 1997, it was grown in one trial at Aberdeen where it had lower yield and smaller size than Atlantic or Chipeta (Idaho Table 8). It had similar specific gravity to that of Atlantic and had chip better color than any of the standard varieties. NDO1496-1 has shown the ability to chip acceptably from cold storage and to recondition well. It has performed well in processor trials and will likely be released in 1998 or 1999.

IDAHO TABLE 1. Performance of russet potato selections on the farm of Gary Summers at Rexburg, Idaho, in 1998.

Clone	Total Yield	U.S. No. 1's			Culls &		Specific Gravity	Hollow Heart/ ¹ Brown Center		Blackspot/ ² Bruise		Shatter/ ³ Bruise		Fry 40 ⁴ Color		Fry 45 ⁴ Color	
		Yield	%	> 12 oz	6 to 12 oz	< 4 oz	U.S.No. 2										
		-----cwt/acre-----			----- % -----												
RUSSET BURBANK	191	57	30	5	14	28	42		1.074		10		2.9	3.1	3.4	1.8	
RANGER RUSSET	343	225	66	31	27	9	26		1.081		0		3.4	2.8	3.1	1.6	
RUSSET NORKOTAH	163	102	63	6	35	31	6		1.066		4		3.2	3.0	3.0	2.3	
A81473-2	243	164	67	18	37	21	12		1.080		2		2.7	2.8	3.0	2.3	
A82360-7	380	281	74	15	42	20	6		1.083		2		2.1	3.1	2.9	1.0	
A84118-3	288	225	78	19	43	11	10		1.084		2		1.3	2.6	2.9	1.7	
A8495-1	306	187	61	9	32	30	9		1.082		5		2.6	3.3	2.4	0.9	
AO82611-7	325	150	46	9	25	23	30		1.079		0		3.0	3.0	2.9	2.2	
COO83008-1	206	145	70	12	36	21	8		1.082		2		1.7	2.7	3.1	1.7	
CORN-3	268	163	61	24	27	17	22		1.071		3		3.3	3.0	3.7	2.9	
CORN-8	201	119	59	13	34	20	20		1.068		9		3.4	3.3	3.6	2.6	
Mean	265	165	61	15	32	21	17		1.077		3		2.7	2.9	3.1	1.9	
LSD (.05)	38	42							0.003				0.4	0.3	0.7	0.5	
LSD (.01)	50	56							0.004				0.5	0.4	0.9	0.7	

¹ Hollow heart/brown center was determined by cutting tubers > 12 oz.² Blackspot bruise measured using a 1-5 scale where 1 = resistant, 5 = susceptible.³ Shatter bruise measured using a 1-5 scale where 1 = resistant, 5 = susceptible.⁴ USDA fry grade score with lower score indicating lighter color; potatoes stored at 40 or 45°F.

IDAHO TABLE 2. Performance of russet and red potato selections on the farm of Reed Searle at Shelley, Idaho, in 1998.

Clone	Total		U.S. No. 1's		Culls &		Specific		Hollow Heart/ ¹		Blackspot ²		Shatter ³		Fry 40 ⁴		Fry 45 ⁴	
	Yield	Yield	%	> 12 oz	6 to 12 oz	< 4 oz	U.S.No. 2	Gravity	Brown	Center	Bruise	Bruise	Bruise	Bruise	Color	Color	Color	Color
	-----cwt/acre-----		----- % -----		----- % -----		----- % -----		----- % -----		----- % -----		----- % -----		----- % -----		----- % -----	
RUSSET BURBANK	339	213	63	9	34	20	17	1.076	5		3.1	3.3		3.4	1.2			
RANGER RUSSET	544	422	78	11	45	17	6	1.090	0		4.6	2.7		2.4	1.3			
RUSSET NORKOTAH	287	201	70	3	37	27	3	1.070	2		3.7	2.7		3.1	2.3			
A81473-2	447	380	85	22	46	12	3	1.084	20		4.0	2.5		2.5	1.9			
A82360-7	588	494	84	25	45	10	6	1.090	0		2.1	2.6		2.1	1.2			
A84118-3	423	343	81	6	45	18	1	1.090	0		1.9	2.7		3.0	1.9			
A8495-1	409	265	65	7	34	32	3	1.090	5		4.0	3.0		2.0	0.8			
AO82611-7	475	343	72	9	44	18	10	1.090	0		4.1	2.8		2.4	1.7			
COO83008-1	399	330	83	12	50	14	4	1.087	0		2.7	2.7		2.3	1.1			
CORN-3	439	359	82	29	43	10	8	1.076	18		3.3	2.7		3.5	2.4			
CORN-8	369	304	82	22	45	13	5	1.073	5		3.3	2.8		3.4	1.9			
IDAROSE	501	442	88	23	48	10	2	1.066	2		3.0	4.5		4.0	4.0			
TX1385-12RU	550	488	89	42	37	6	5	1.083	5		3.0	3.5		1.9	0.5			
LEMHI RUSSET	310	238	77	26	34	15	8	1.079	25		4.8	3.4		2.4	1.8			
ND111-28	283	172	61	9	29	33	6	1.081	9		4.4	3.4		2.7	1.5			
Mean	424	333	77	17	41	17	6	1.082	6		3.5	3.0		2.7	1.7			
LSD (.05)	58	58						0.003			0.3	0.2		0.4	0.4			
LSD (.01)	76	77						0.004			0.4	0.3		0.5	0.5			

¹ Hollow heart/brown center was determined by cutting tubers > 12 oz.

² Blackspot bruise measured using a 1-5 scale where 1 = resistant, 5 = susceptible.

³ Shatter bruise measured using a 1-5 scale where 1 = resistant, 5 = susceptible.

⁴ USDA fry grade score with lower score indicating lighter color; potatoes stored at 40 or 45°F.

IDAHO TABLE 3. Performance of russet and processing potato selections grown on the Parma, Idaho, Experiment Station in 1998.

Clone	Total Yield	U.S. No. 1's		Culls &		Specific Gravity	Hollow Heart/ ¹		Sugar ²		Fry ³ Color
		Yield	%	>12 oz	6 to 12 oz		<4 oz	U.S.No. 2	Brown Center	Ends	
-----cwt/acre-----											
RUSSET BURBANK	549	193	35	2	18	17	48	1.074	0	82	2.1
RANGER RUSSET	489	253	52	11	30	10	38	1.082	0	82	2.2
SHEPODY	563	289	51	11	32	9	40	1.067	0	59	3.5
A81473-2	597	506	85	45	35	4	11	1.083	5	54	1.8
A82360-7	694	441	64	2	32	22	14	1.080	8	21	1.2
A84118-3	460	397	86	20	50	11	3	1.083	10	61	1.6
A8893-1	443	378	85	12	57	10	5	1.071	5	22	1.6
A9045-7	526	424	81	23	49	6	13	1.079	0	81	1.8
A91194-4	617	515	83	31	44	5	12	1.079	0	78	2.6
AO82611-7	514	288	56	1	28	25	19	1.077	0	34	1.8
Mean	545	368	68	16	38	12	20	1.077	3	57	2.0
LSD (.05)	85	87						0.004		22	0.4
LSD (.01)	115	117						0.005		30	0.5

¹ Hollow heart/brown center was determined by cutting tubers > 12 oz.² Percent of tubers producing fries with ends rated 3+ and at least 1 full point darker than the remainder of the fry.³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 4. Performance of russet potato selections in the Idaho location of the Tri-State (Idaho, Oregon, Washington) variety trial grown on the Aberdeen Experiment Station in 1998.

Clone	Total Yield	U.S. No. 1's		Culls &		Specific Gravity	Hollow Heart/ ¹ Blackspot ²		Shatter ³ Bruise	Fry 40 ⁴		Fry 45 ⁴	
		Yield	%	> 12 oz	6 to 12 oz		< 4 oz	U.S.No. 2		Brown Center	Bruise	Color	Color
-----cwt/acre-----													
----- % -----													
RUSSET BURBANK	343	153	45	11	22	10	45	1.078	23	3.2	3.4	2.8	1.1
RANGER RUSSET	403	350	87	33	49	2	11	1.087	0	4.7	3.0	2.0	1.3
A8893-1	407	358	88	18	52	9	3	1.084	23	3.5	3.1	1.7	0.5
A89219-7	496	448	90	58	29	3	7	1.087	33	3.3	3.1	1.7	0.7
A9014-2	407	370	91	25	51	8	1	1.087	10	2.6	3.0	0.7	0.4
AO90014-1	247	210	85	13	50	14	1	1.086	3	2.3	3.4	0.9	0.7
AO88103-3	458	378	83	13	50	15	3	1.086	68	3.5	2.4	1.8	0.8
FR43	303	178	59	3	29	24	17	1.077	13	3.3	3.2	3.3	1.8
Mean	383	306	78	22	41	11	11	1.084	21	3.3	3.1	1.9	0.9
LSD (.05)	66	63						0.004		0.6	0.6	0.6	0.4
LSD (.01)	90	85						0.005		0.8	0.8	0.8	0.6

¹ Hollow heart/brown center was determined by cutting tubers > 12 oz.

² Blackspot bruise measured using a 1-5 scale where 1 = resistant, 5 = susceptible.

³ Shatter bruise measured using a 1-5 scale where 1 = resistant, 5 = susceptible.

⁴ USDA fry grade score with lower score indicating lighter color; potatoes stored at 40 or 45 °F.

IDAHO TABLE 5. Performance of advanced russet potato selections grown at the Aberdeen, Idaho, Experiment Station in 1998.

Clone	Total Yield	Culls and										Merit ⁴ Score	
		U.S. No. 1's		U.S. No. 2's		Specific Gravity	Hollow ¹ Heart	Blackspot ² Bruise	Fry Color ³				
		Yield	%	>12 oz	6 to 12 oz				<4 oz	Malformed	40°F		45°F
-----cwt/acre-----													
Russet Burbank	386	259	67	9	40	14	18	1.077	0	2.7	3.5	0.6	2.8
Ranger Russet	462	388	84	35	40	5	10	1.085	0	3.3	2.9	0.6	3.3
Lemhi Russet	399	287	72	16	37	20	8	1.080	51	4.3	2.4	0.5	3.3
Gem Russet	397	349	88	19	47	11	1	1.087	16	3.4	2.4	0.4	4.0
A88338-1	508	432	85	36	39	7	8	1.082	15	2.4	2.7	0.5	3.0
A89384-10	480	403	84	25	44	8	8	1.082	3	1.5	2.7	1.1	3.8
A9014-2	461	415	90	31	47	8	2	1.084	33	2.2	1.7	0.3	3.8
A9057-7	316	259	82	31	41	10	8	1.074	28	2.8	2.7	1.1	2.8
A91325-6	379	341	90	35	43	7	2	1.079	15	1.2	1.5	0.3	3.3
A9201-6	484	426	88	57	26	4	8	1.079	0	2.7	3.8	1.4	3.3
A9202-1	274	206	75	20	34	20	6	1.094	15	3.0	2.9	1.7	3.0
A9206-2	384	253	66	27	30	8	27	1.081	0	2.9	2.3	0.8	2.3
A9230-4	391	328	84	16	50	12	4	1.087	0	3.6	2.6	0.4	3.5
A9230-5	321	299	93	33	51	6	0	1.083	0	3.6	2.8	0.8	3.0
A90586-11	431	358	83	28	42	11	6	1.087	15	4.0	3.8	1.0	3.0
A92158-3	602	500	83	35	38	8	9	1.073	18	1.8	3.1	0.8	3.0
A92303-7	424	360	85	29	43	10	4	1.081	0	2.8	1.9	0.5	3.3
A92358-1	504	418	83	20	47	12	5	1.076	3	2.9	2.8	0.8	3.0
Mean													
LSD (.05)	50							0.004		0.5	0.6	0.3	0.8

¹ Hollow heart was measured by cutting tubers > 12 oz.² 1-5 scale with 1 = resistant, 5 = susceptible.³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 40° or 45°F until late February.⁴ Merit Score is similar to a breeder's preference rating and is based on overall appearance and size of field run potatoes, 1-5 scale with 5 = best.

IDAHO TABLE 6. Performance of advanced russet potato selections grown at the Kimberly, Idaho, Experiment Station in 1998.

Clone	Total Yield	Culls and										Merit ⁴ Score	
		U.S. No. 1's		U.S. No. 2's		Specific Gravity	Hollow ¹ Heart	Blackspot ² Bruise	Fry Color ³				
		%	> 12 oz	%	6 to 12 oz				<4 oz	Malformed	40°F		45°F
-----cwt/acre-----													
Russet Burbank	490	319	65	12	36	17	18	1.083	0	3.1	2.9	1.0	2.8
Ranger Russet	552	475	86	28	46	6	8	1.096	0	3.8	3.7	1.0	3.8
Lemhi Russet	557	457	82	15	45	15	3	1.097	13	4.8	1.5	0.6	3.0
Gem Russet	514	411	80	4	48	19	1	1.097	8	4.1	2.7	0.6	3.3
A88338-1	506	440	87	24	52	7	6	1.084	3	2.5	3.5	1.7	3.0
A89384-10	511	434	85	18	49	9	6	1.098	0	2.6	2.7	0.6	3.5
A9014-2	475	428	90	23	51	8	2	1.093	18	2.9	2.1	0.8	3.0
A9057-7	300	252	84	38	33	8	8	1.086	8	3.2	4.0	1.8	2.8
A91325-6	489	406	83	18	50	9	8	1.091	0	1.8	2.0	0.6	2.8
A9201-6	430	383	89	41	41	4	6	1.081	3	3.2	3.6	1.5	3.8
A9202-1	329	250	76	17	39	20	4	1.097	19	3.7	3.5	1.6	3.0
A9206-2	446	348	78	33	36	7	15	1.092	10	4.2	1.7	0.5	3.3
A9230-4	408	318	78	12	44	21	1	1.099	4	3.8	2.7	0.5	3.0
A9230-5	444	400	90	46	32	7	3	1.097	18	4.2	3.1	1.4	3.0
A92158-3	533	469	88	24	48	10	2	1.088	8	2.0	3.0	0.8	3.3
A92303-7	517	439	85	24	46	11	4	1.089	3	3.9	2.4	1.0	4.0
A92358-1	481	409	85	16	50	12	3	1.089	3	3.4	3.1	0.6	2.8
A90586-11	568	460	81	22	44	13	6	1.095	5	3.5	3.7	1.4	3.3
Mean													
LSD (.05)	82							0.005		0.6	0.9	0.5	0.6

¹ Hollow heart was measured by cutting tubers > 12 oz.

² 1-5 scale with 1 = resistant, 5 = susceptible.

³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 40° or 45°F until late February.

⁴ Merit Score is similar to a breeder's preference rating and is based on overall appearance and size of field run potatoes, 1-5 scale with 5 = best.

IDAHO TABLE 7. Performance of chipping selections in the Idaho location of the Western Regional Chipping Trial grown on the Aberdeen, Idaho, Experiment Station in 1998.

Clone	Total Yield	U.S. No. 1's			Culls & U.S.No. 2		Specific Gravity	Hollow Heart ¹ Brown Center	Blackspot ² Bruise	Shatter ³ Bruise	Chip 40 ⁴ Color	Chip 50 ⁴ Color
		Yield	%	> 12 oz	< 4 oz	U.S.No. 2						
		---cwt/acre---	%	----- %				-%-				
ATLANTIC	249	202	81	10	16	3	1.089	18	2.9	3.4	3.1	2.0
CHIPETA	382	289	76	37	7	17	1.075	18	2.8	3.9	3.8	2.0
A88431-1	425	346	81	18	12	7	1.094	8	2.1	4.0	2.4	1.2
A90467-14	444	349	79	5	20	1	1.093	13	2.3	3.6	2.1	1.0
AC87340-3	428	324	76	2	24	0	1.079	0	1.1	3.2	2.5	1.0
AO91812-1	530	459	87	25	12	2	1.087	0	2.5	2.3	3.4	1.5
AO91812-2	521	409	79	13	15	6	1.083	8	1.7	2.6	2.8	1.5
MEAN	426	340	80	16	15	5	1.086	9	2.2	3.3	2.9	1.5
LSD (.05)	51	60					0.004		0.4	0.4	0.7	0.4
LSD (.01)	70	82					0.005		0.5	0.6	0.9	0.6

¹ Hollow heart/brown center was determined by cutting tubers > 12 oz.

² Blackspot bruise measured using a 1-5 scale where 1 = resistant, 5 = susceptible.

³ Shatter bruise measured using a 1-5 scale where 1 = resistant, 5 = susceptible.

⁴ Chip color grade score with lower score indicating lighter color; potatoes stored at 40 or 50°F.

IDAHO TABLE 8. Performance of advanced chipping potato selections grown on the Aberdeen, Idaho, Experiment Station in 1998.

Clone	Total Yield	Culls and										Specific Gravity	Hollow ¹ Heart	Blackspot ²		Chip Color ³		Merit ⁴ Score
		U.S. No. 1's		U.S. No. 2's		Bruise	Dec45°F	Feb40°F	Feb45°F									
		Yield	%	>12 oz	4 to 12 oz					<4 oz	Malformed							
-cwt/acre-																		
-%-																		
Chipeta	535	455	85	42	43	7	8	1.075	10	2.4	2.5	3.8	1.9	3.8				
Gemchip	486	418	86	30	56	12	2	1.076	25	2.8	2.5	3.7	1.9	4.0				
Snowden	334	224	67	8	59	33	0	1.084	20	2.8	1.5	2.9	1.1	3.0				
NDO1496-1	382	267	70	12	58	29	1	1.086	6	2.2	1.0	1.9	1.0	3.5				
A88431-1	410	340	83	29	55	11	5	1.090	7	2.3	1.6	3.0	1.2	3.8				
A91746-8	442	314	71	9	61	22	8	1.076	10	2.5	1.0	2.1	1.1	3.3				
A91790-13	418	330	79	15	63	21	0	1.081	0	1.3	1.0	1.8	1.1	3.8				
A91814-5	573	395	69	12	57	21	10	1.084	0	2.6	1.5	2.7	1.4	3.0				
A92541-1	515	288	56	9	47	9	35	1.076	18	3.2	1.1	1.9	1.2	2.3				
COA92060-7	316	240	76	7	69	22	2	1.080	0	4.2	1.2	2.5	1.2	3.0				
ATX85404-8W	493	380	77	8	69	22	1	1.079	12	2.9	1.3	2.0	1.4	3.5				
NDA5678-1	337	270	80	13	67	18	2	1.068	0	2.6	1.2	2.3	1.5	3.0				
NDA5698-8	466	340	73	10	62	23	4	1.080	11	2.0	1.2	2.7	1.2	3.5				
NDA5705-1	407	305	75	9	66	21	4	1.083	0	3.0	1.1	1.3	1.0	3.3				
W1313	393	259	66	4	62	26	8	1.093	19	2.3	1.2	2.1	1.2	2.8				
Mean																		
LSD (.05)	73							0.003		0.6	0.4	0.5	0.4	0.6				

¹ Hollow heart was measured by cutting tubers > 12 oz.

² 1-5 scale with 1 = resistant, 5 = susceptible.

³ Chip color rated using the SFA color chart, 0-5 scale with 2 or less considered acceptable. Tubers were chipped directly from 40°F or 45°F storage.

⁴ Merit score is similar to a breeders' preference rating and is based on appearance and size of field-run potatoes, 1-5 scale with 5 = best.

IDAHO TABLE 9. Performance of advanced high dry matter potato selections grown on the Aberdeen, Idaho, Experiment Station in 1998.

Clone	Total Yield	U.S. No. 1's		Culls & U.S. No. 2's		Specific Gravity	Hollow ¹ Heart -%	Blackspot ² Bruise	Fry ³ Color	Dry Matter Yield lb/A
		Yield	%	>12 oz	6 to 12 oz	<4 oz	%	Malformed		
		-----cwt/acre-----								
Russet Burbank	316	186	59	5	36	21		20	2.7	0.7
Lemhi Russet	311	221	71	11	40	24		5	4.5	0.5
Bzura	259	137	53	3	31	27		20	1.7	1.7
A82360-7	334	240	72	21	40	17		11	2.4	0.5
A8792-1	412	321	78	23	42	10		12	2.1	0.3
A89216-11	394	331	84	41	33	11		5	1.7	0.9
A9130-17	414	335	81	33	36	13		6	1.7	2.0
A9139-1	363	341	94	43	44	3		2	1.3	0.5
A92294-6	498	354	71	22	37	12		16	2.0	0.6
A92408-11	337	253	75	28	34	13		12	3.3	0.6
A92644-2	456	374	82	26	43	8		9	1.7	0.3
A9115-7	307	224	73	24	35	11		16	3.3	1.1
A9370-1	366	340	93	52	37	4		3	1.5	0.3
A93134-3	396	253	64	2	33	29		7	3.0	0.3
Mean										
LSD (.05)	78							0.005	0.6	0.4
										1820

¹ Hollow heart was measured by cutting tubers >12 oz.² 1-5 rating with 1 = resistant, 5 = susceptible.³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 10. Performance of advanced high dry matter potato selections grown on the Kimberly, Idaho, Experiment Station in 1998.

Clone	Total Yield	U.S. No. 1's		Culls & U.S. No. 2's		Specific Gravity	Hollow ¹ Heart	Blackspot ² Bruise	Fry ³ Color	Dry Matter Yield		
		Yield	%	>12 oz	6 to 12 oz							
		%										
-----cwt/acre-----												
Russet Burbank	391	262	67	11	34	18	15	1.075	11	3.4	1.3	7850
Lemhi Russet	511	393	77	8	44	15	3	1.095	33	4.8	0.6	12210
A82360-7	407	293	72	10	40	24	4	1.084	5	2.2	1.0	8860
A8792-1	440	387	88	23	49	9	3	1.093	3	3.2	0.9	10370
A89216-11	504	398	79	29	41	9	12	1.094	7	2.8	1.6	11960
A9130-17	403	322	80	15	51	13	6	1.095	19	2.8	2.0	9600
A9139-1	447	420	94	56	35	3	3	1.092	20	2.4	0.9	10450
A92294-6	495	391	79	12	46	12	9	1.095	0	3.8	0.7	11810
A92408-11	320	202	63	11	37	15	22	1.095	7	3.7	0.6	7660
A92644-2	386	320	83	16	50	15	2	1.098	0	2.7	0.5	11900
Mean												
LSD (.05)	103							0.005		0.6	0.5	2520

¹ Hollow heart was measured by cutting tubers > 12 oz.² 1-5 rating with 1 = resistant, 5 = susceptible.³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 11. Sensory evaluations of baked potatoes from breeding selections grown at the Aberdeen, Idaho, Experiment Station in 1998.¹

Clone	At harvest			Overall	After 5 Months Storage (40°F)			Overall
	Color	Texture	Flavor		Color	Texture	Flavor	
Russet Burbank	6.0 b	5.9 ab	5.7 bc	5.8 bc	6.6 bc	6.3 a	6.0 ab	6.2 ab
Bannock Russet	6.0 b	5.6 b	5.4 c	5.5 c	6.4 c	5.9 b	5.9 b	6.0 b
A84118-3	6.7 a	5.9 ab	6.1 a	6.1 a	6.8 ab	6.1 ab	6.1 ab	6.2 ab
A8893-1	6.6 a	5.9 a	5.8 ab	6.0 ab	6.9 a	6.1 ab	6.3 a	6.3 a
A88338-1	6.5 a	5.8 ab	5.8 b	5.9 ab	6.4 c	6.0 ab	6.0 ab	6.1 ab
A82360-7	6.4 a	5.7 ab	5.7 bc	5.8 b	6.7 ab	6.0 b	6.0 ab	6.1 ab

¹ Evaluations were made by trained panelists using double blind procedures. Approximately 100 tests were done on each clone. Each baked potato was rated for color, texture, flavor, and overall appeal. Ratings were made using a 1-9 scale with 9 = best. Means were separated using Duncan's Multiple Range Test, and means followed by the same letter are not significantly different.

IDAHO TABLE 12. Reaction of potato clones to the herbicide metribuzin (Sencor/Lexone) in 1998.¹

Clone	Plant Injury ² 21 Days Following Application	Predicted ³ Yield Reduction Due to Injury ²	Relative ⁴ Susceptibility to Injury
----- % -----			
<u>Russet and Long Whites</u>			
Russet Burbank	20	5	R
Russet Norkotah	33	15	MR
Shepody	80	65	VS
A8893-1	23	4	VR
A88338-1	33	16	MR
A89219-7	13	0	VR
A9014-2	30	12	MR
AC87084-3	94	89	VS
AC88042-1	55	32	MS
AC88165-3	33	15	MR
AO87277-6	50	24	MS
AO89128-4	8	0	VR
AO90014-1	5	0	VR
AO88103-3	3	0	VR
NDD840-1	5	0	VR
TX1385-12Ru	5	1	VR
<u>Chippers and Round Whites</u>			
Atlantic	75	52	S
Avalanche	83	65	VS
Crispin	3	0	VR
A88431-1	33	14	MR
A90467-14	18	3	VR
AC87340-3	45	21	MS
AO91812-1	33	15	MR
AO91812-2	40	26	MS
<u>Reds</u>			
Red LaSoda	20	11	MR
Cherry Red	15	0	VR
A79543-4R	63	42	S
AO92657-3R	99	100	VS
CO89097-2	50	26	MS
COO86107-1R	53	35	MS
NDO2438-6R	45	28	MS
NDO2686-6R	70	44	S
NOD4300-1R	25	5	R
NDO4588-5R	33	13	MR
NDO4592-3R	55	33	MS
NDC4069-4R/R	100	100	VS

¹ Metribuzin applied postemergence (8-12 inch plants) at a rate of 1.0 lb a.i./A (17.5 gpa, 30 psi).

² Plant injury was recorded as the percentage of foliage from an average plant in each plot that showed typical metribuzin symptoms (chlorosis, necrosis, vein clearing, etc.)

³ Predicted yield reduction is expressed as percent loss compared to untreated plots and was calculated using the following equation: Yield reduction = $[1 - (1.142 + 0.176 (\log (\text{plant height treated} / \text{plant height untreated})) - 0.00796 (\text{plant injury}))] \times 100$.

⁴ VR = very resistant, R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible.

IDAHO TABLE 13. Evaluation of potato cultivars and breeding selections for resistance to field diseases and soft rot, in 1998.

	Cultivar or Selection	Verticillium Wilt ¹	Early Blight ²	Common Scab ³	Erwinia Soft Rot ⁴
WESTERN REGIONAL TRIAL	A88338-1.....	2.7	4.7	0.0	1.7
	AC87084-3.....	3.7	5.5	0.4	2.4
	AC88042-1.....	7.4	8.5	0.1	4.0
	AC88165-3.....	5.9	7.5	0.1	3.1
	AO87277-6.....	6.3	7.9	1.0	4.5
	AO89128-4.....	3.0	5.4	0.5	2.7
	Avalanche.....	4.4	6.0	0.6	3.8
	CORN-3*.....	6.5	7.5	0.0	3.3
	CORN-8*.....	8.2	8.7	0.0	4.1
	NDD840-1.....	4.4	6.4	0.0	3.1
	TX1385-12Ru.....	7.7	8.7	0.3	4.1
	TXNS112*.....	8.0	8.7	0.2	4.1
	TXNS223*.....	7.7	8.5	0.1	3.7
	TXNS278*.....	7.9	8.5	0.0	3.7
TRI STATE TRIAL	A8893-1.....	7.7	8.7	0.0	3.5
	A89219-7.....	3.2	5.0	0.3	3.0
	A9014-2.....	4.5	6.9	0.2	1.5
	AO90014-1.....	8.0	9.0	—	4.4
	AO88103-3.....	4.2	6.5	0.0	3.3
	FR43 (Shepody).....	6.9	8.5	1.9	4.7
REGIONAL CHIP TRIAL	A88431-1.....	3.3	5.5	1.4	3.5
	A90467-14.....	2.4	4.2	0.9	1.3
	AC87340-3.....	5.5	7.0	3.2	3.9
MISCELLANEOUS VARIETIES	A8495-1 (Gem).....	6.0	7.3	1.6	1.7
	COO83008-1 (Legend).....	3.2	5.3	0.0	2.8
	AO82611-7 (Umatilla).....	6.2	7.4	0.0	1.8
	A90586-11.....	2.9	3.5	2.3	3.3
	A82360-7.....	2.4	3.7	0.2	1.7
NAMED VARIETIES	Atlantic.....	7.8	8.9	1.3	2.3
	Chipeta.....	2.9	4.9	0.4	3.0
	Russet Burbank.....	6.7	7.7	0.0	3.9
	Ranger Russet.....	3.4	5.0	2.6	3.2
	Russet Norkotah.....	9.0	9.0	0.1	4.1
	Shepody.....	5.7	8.2	2.6	4.1
	LSD (p=0.05).....	1.3	1.2	1.0	1.4

¹ Verticillium wilt 0 to 9 scale: 0 = none; 9 = >90% stems dead or dying with typical Verticillium wilt symptoms.

² Early blight 0 to 9 scale: 0 = none; 9 = >90% leaflets with severe blight lesions or necrosis due to early blight.

³ Common scab 0 to 5 scale: 0 = none; 5 = all tubers unmarketable due to scab.

⁴ Erwinia soft rot 0 to 5 scale; 0 = no rot; 5 = all tubers >50% decayed.

* Russet Norkotah selections.

IDAHO TABLE 14. Evaluation of varieties, advanced selections, and resistant germplasm for foliar late blight at Mt. Vernon, Washington, in 1998.

Entry	AUDPC ^{1,2}	Ranked Tuber Blight ^{2,3,4}	Ranked Total Yield ^{2,3,5}	Entry	AUDPC ^{1,2}	Ranked Tuber Blight ^{2,3,4}	Ranked Total Yield ^{2,3,5}
Ranger Russet	5178 vw	0.1	0.6 u-x	NDD840-1	4134 h-o	0.0	1.5 o-t
A9014-2	5170 w	0.0	0.2 x	A88338-1	3990 m-p	0.0	3.3 n-s
White Rose	5076 vw	0.0	1.2 p-v	Avalanche	3960 h-n	0.0	6.1 e-j
AC88165-3	5041 vw	7.3	0.6 vwx	Red LaSoda	3820 g-m	0.0	4.8 g-m
A89219-7	5015 uvw	2.6	0.5 wx	AC87340-3	3812 g-l	0.4	4.4 h-n
AO87277-6	4977 t-w	0.4	1.2 p-u	AC87084-3	3611 g-k	0.0	2.6 j-p
TX1385-12RU	4973 uvs	1.0	1.2 p-v	Kennebec	3607 f-l	0.0	5.4 f-k
AC88042-1	4970 t-w	0.0	0.5 wx	COO83008-1	3542 e-h	0.0	5.6 g-l
Norchip	4947 s-w	2.9	1.9 m-s	CORN3*	3402 f-j	0.2	2.0 k-q
A8893-1	4918 r-w	0.0	0.8 t-w	Brador	2908 d-h	5.3	7.5 d-i
Russet Norkotah	4839 q-v	2.8	1.1 s-w	Bzura	2053 c-g	0.1	12.9 a-d
TXNS112*	4678 p-u	0.0	1.0 r-w	A90586-11	1381 b-g	0.0	18.0 a
TXNS278*	4612 o-s	0.0	0.8 t-w	PI58333.1A1	1270 b-f	1.7	9.4 c-h
AO8103-3	4609 p-t	0.0	0.7 u-x	A95017-14	737 b-e	0.5	11.9 a-f
Russet Burbank	4592 p-s	0.1	1.5 o-t	A95053-55	681 a-d	0.3	18.0 ab
A88431-1	4580 o-r	11.3	0.7 u-x	A95020-84	603 abc	0.3	10.7 a-g
Shepody	4575 o-r	0.0	1.2 q-w	A95051-2	570 abc	0.3	17.2 ab
Alpha	4574 o-r	4.1	1.1 s-w	A95017-80	506 abc	0.2	10.1 b-h
TXNS223*	4541 opq	0.0	1.7 p-t	A95020-92	499 ab	5.9	12.5 a-d
AO89128-4	4504 p-s	0.5	1.4 q-w	A95053-61	452 ab	1.4	16.9 ab
Cascade	4436 l-p	0.0	2.9 i-o	A95020-17	420 ab	0.5	10.8 a-g
FR43	4311 k-p	1.0	1.8 o-t	A95017-66	383 ab	0.0	10.4 b-h
Elba	4303 i-p	2.5	2.0 m-s	AWN86514	349 ab	0.0	11.9 a-e
CORN8*	4253 j-p	0.2	1.6 p-t	A95020-70	119 a	1.1	15.4 abc
A90467-14	4145 n-q	0.0	3.6 l-r				

¹Data back-transformed for presentation. ²Means within the same columns followed by the same letter are not significantly different ($P=0.05$) as determined by least significant difference test. ³Data not back-transformed; the higher the value the greater the tuber blight or yield. ⁴Percent by weight. ⁵Lb/plot. *Russet Norkotah selections.

IDAHO TABLE 15. Response to late blight pressure at Corvallis, Oregon, 1998.

Entry	Foliar Rating ¹	% Tuber Infection ²	Severity Index ³
Russet Burbank	71.2	22.5	6.0
Russet Norkotah	92.5	12.5	2.0
Ranger Russet	62.5	50.0	6.2
Legend	70.0	7.5	3.0
Umatilla	82.5	17.5	5.0
Shepody	81.2	22.5	5.2
A8495-1	86.2	20.0	4.2
A88338-1	46.2	12.5	4.0
AC87084-3	53.7	22.5	5.0
AC88042-1	95.0	15.0	6.0
AC88165-3	81.2	37.5	4.5
AO85165-3	61.2	42.5	4.5
AO87277-6	76.2	10.0	3.2
AO88103-3	80.0	30.0	6.0
AO89128-4	72.5	22.5	6.2
AO90014-1	92.5	5.0	4.7
AO90319-1	71.2	2.5	2.5
CORN-3*	75.0	47.5	7.0
CORN-8*	76.2	45.0	7.0
TX1385-12	90.0	32.5	6.7
TXNS-112*	86.2	22.5	7.0
TXNS-223*	92.5	20.0	4.2
TXNS-278*	90.0	20.0	5.7
Dk. R. Norland	96.2	12.5	6.7
Red LaSoda	94.5	12.5	5.0
Sangre	77.5	15.0	6.0
AO92657-3	100.0	17.5	7.2
CO89097-2	98.7	25.0	8.0
COO86107-1	100.0	5.0	2.0
DT6063-1	98.7	10.0	6.0
NDO2438-6	100.0	5.0	2.0
NDO2686-6	100.0	0.0	0.0
NDO4300-1	100.0	10.0	4.5
NDO4588-5	97.5	5.0	2.2
NOD4592-3	100.0	12.5	4.7
Atlantic	92.5	0.0	0.0
Avalanche	70.0	20.0	6.7
Chipeta	60.0	37.5	6.7
A88431-1	52.5	47.5	7.2
AC87340-2	75.0	25.0	7.2
Mean	82.6	20.0	5.0
CV (%)	15.4	67.3	59.7
LSD (0.05)	17.8	18.8	4.2

¹ Percent leaf surface infected with late blight (0 = 0%, 50 = 50%, 100 = 100% leaf surface dead).

² Percent of tubers showing late blight infection based on 10 randomly selected tubers per plot.

³ Decay severity rating (includes secondary infection): 1 = minor decay, 5 = moderate decay, 10 = severe decay.

* Russet Norkotah selections

Maine

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Introduction: Potato variety trials were conducted at three locations in Maine as part of the NE184 Regional Project (Development of New Potato Clones for Environmental and Economic Sustainability in the Northeast). Thirty-eight potato varieties and clones were tested at Aroostook Research Farm, Presque Isle, Maine. Seventeen NE184 varieties and lines were tested on a commercial farm in Exeter (central Maine), while thirty-three varieties and lines were tested on a commercial farm in St. Agatha (northern Maine). Additional trials of advanced selections (pre-regional trial entries) from the USDA-ARS program in Beltsville and the Maine Potato Breeding Program were conducted at the two commercial locations. The primary objective of all of the Maine trials is to determine performance, quality, and storage characteristics of promising potato clones and new varieties in Maine.

Methods: Single-row plots, 25 feet long, were utilized for the NE184 trials. All trials were hand planted using randomized complete block designs and four replications. The seedpiece spacing used for each line is listed in subsequent tables. Details of important management practices are presented in Maine Table 1. At the Presque Isle site the varieties were grouped so that separate tests could be vinekilled and harvested based on maturity classification. Remaining cultural practices were similar to those used on commercial farms in the area. Specific gravity was determined at harvest using the weight-in-air/weight-in-water method. Hollow heart ratings indicate the number of hollow tubers observed per 40 large tubers examined. Unless noted otherwise chip color evaluations were conducted during December following storage at 50°F. Chips were fried at 350°F for three minutes and evaluated using an Agron M35, calibrated with the black "0" disk = 0 and the white "90" disk = 90. Chips were crushed and reported values are means from four replicates per variety. Each sample was read three times with thorough mixing between readings.

Results:

Rainfall, General Growth, and Plant Stands. Rainfall by month and location is listed in Maine Table 2. All three sites experienced an extended dry period during late July and August despite relatively high total rainfall for the full growing season. Plant growth was generally very vigorous at all three sites. Dark Red Norland, Monona, Russet Norkotah, AF1565-12, and AF1480-5 were smaller and less vigorous at mid-season than most other lines in the NE184 trials. Slight to moderate early-dying symptoms were observed on several lines at each location. Dark Red Norland, Itasca, MaineChip, Niska, Russet Norkotah, Shepody, Superior, B0564-8, and NY103 displayed early-dying symptoms at the Aroostook Research Farm site. CO083008-1 had pronounced marginal leaf necrosis; however, the symptoms were not typical of early dying and the cause of this disorder was not determined. B0564-8 was most severely affected by early dying at the central Maine site, while Itasca, Superior, and AF1424-7 had moderate disease levels. Dark Red Norland, Russet Norkotah, Yukon Gold, B0564-8, B0811-13, and CO083008-1 had early-dying symptoms at the St. Agatha site. Very low levels of late blight infection were observed at the Presque Isle and central Maine sites. Plant stands equaled or exceeded 90% of targets for most NE-184 lines. The only exception was at St. Agatha where Katahdin had 83% stands. Yields were quite high at all three sites.

Aroostook Research Farm NE184 Regional Potato Variety Trials. Dark Red Norland, Superior, and AF1565-12 were particularly early maturing in the early/medium-early trial. Only Chieftain exceeded Superior in total yields (Maine Table 3). U.S. #1 yields of Chieftain were significantly higher than Superior, while those of Monona, NorDonna, AF1565-12, and B0811-13 were significantly lower. Atlantic was the only high specific gravity line in the test. Atlantic, Monona, Superior, AF1565-12, and B0811-13 sized well for table use. Tubers of Chieftain, Monona,

Superior, AF1437-1, and AF1565-12 were rated particularly attractive (Maine Table 4). There were relatively few external tuber defects in this trial and no hollow heart was detected. Atlantic, Monona, Superior, and AF1437-1 had very good chip color scores. While none of the test lines exceeded the performance of the standards during 1998, Itasca and AF1437-1 performed quite well in this trial (e.g.) and are worthy of further study.

Atlantic produced outstanding yields in the mid-season test and none of the lines equaled Atlantic in total or U.S.#1 yields (Maine Table 5). The test lines that produced moderately-high yields in this trial were B0564-8, B0766-3, NY102, and NY103. MaineChip, Niska, and Snowden had low yields. Atlantic, Kennebec, Niska, B0766-3, and NY103 sized well for table use. MaineChip had particularly small tubers. Atlantic, MaineChip, Snowden, and NY102 specific gravities were very high. There were relatively few external tuber defects and no hollow heart was detected in this trial (Maine Table 6). Tubers of Kennebec, Niska, NY102, and NY103 were rated particularly attractive. With the exception of Kennebec and NY103, chip colors of all test lines equaled or exceeded those of Atlantic. B0564-8, B0766-3, and NY102 were the strongest chipping prospects in this test, while NY103 remains promising for table use.

In the late maturity trial, Yukon Gold senesced relatively early. Shepody and AF1480-5 were low yielding in this test (Maine Table 5). Lines with particularly high U.S.#1 yields were Katahdin and Yukon Gold. Tubers of AF1615-1 were quite small. All of the test lines had specific gravities that equaled that of Katahdin. Tubers of Katahdin, Yukon Gold, and AF1615-1 were rated particularly attractive (Maine Table 6). Rot problems occurred in AF1480-5 (9%) and AF1615-1 (24%), otherwise there were few external defects. No hollow heart was detected in the test.

In the russet or long-type variety test, A84118-3 was very late maturing, Russet Burbank, Century Russet, Russet Norkotah #3, A81386-1, and A86102-6 were late maturing, and Russet Norkotah was early maturing, while the remainder had mid-season maturity (Maine

Table 7). None of the test lines equaled Russet Burbank in total or U.S. #1 yields. A84118-3, A84180-8, A86102-6, B1004-8 and W1151Rus sized poorly. Most lines had lower specific gravities than Russet Burbank; however, A84118-3, A86102-6, A082611-7, B1004-8, and CO083008-1 specific gravities equaled or exceeded that of Russet Burbank. Tubers of Russet Norkotah #8 were particularly attractive (Maine Table 8). Shepody and AO82611-7 had the highest incidence of misshapen tubers in the trial. A86102-6 had relatively high rot incidence (4%). There was relatively little hollow heart in the trial. Century Russet, Russet Norkotah #3, and A86102-6 had significantly poorer chip color scores than Russet Burbank. Overall, Century Russet and the new Russet Norkotah strains were the best table russet prospects in this trial. None of the test lines displayed outstanding processing potential in this trial.

Central Maine NE184 Regional Potato Variety Trial.

Superior, Yukon Gold, and B0564-8 died early in this trial. Katahdin, Kennebec, and AF1615-1 total yields were significantly higher than Atlantic (Maine Table 9). MaineChip, and Superior had significantly lower total yields than Atlantic. Itasca, Niska, Yukon Gold, AF1615-1, B0766-3, NY102 had especially high U.S. #1 yields, but they were not significantly higher than Atlantic. Atlantic, MaineChip, and Snowden exceeded 1.090. Itasca, Monona, Superior, AF1437-1, and NY103 had relatively low specific gravities. Incidence of external defects was quite high in this study (Maine Table 10). Katahdin, and Kennebec had greater than 10% sunburned tubers. Kennebec, Superior, and B0766-3 had $\geq 10\%$ misshapen tubers. Katahdin and Kennebec had greater than 9% scabby tubers. Katahdin had 5% hollow heart out of 40 large tubers examined, otherwise hollow heart was not common in this study. MaineChip, Niska, Snowden, AF1424-7, B0766-3, and NY102 had significantly better chip color scores than Atlantic. Itasca, AF1437-1, AF1615-1, and NY103 were promising tablestock lines in this test. Considering all attributes, the best performing new chipping lines in this test were Niska, B0766-3, and NY102.

Northern Aroostook County NE184 Regional Potato Variety Trials. Chieftain

produced significantly higher total yields than Atlantic, while yields of Snowden, Dark Red Norland, and AF1565-12 were significantly lower (Maine Table 11). Lines with particularly high U.S.#1 yields were Itasca, Superior, B0564-8, and B0811-13. Atlantic, Snowden, Yukon Gold, B0766-3, and NY102 specific gravities exceeded 1.090. Most of the test lines had specific gravities that equaled those of Katahdin; however, those of Chieftain, Dark Red Norland, NorDonna, AF1437-1, AF1565-12, B0811-13, and NY103 were significantly lower. Most lines sized well; however, Dark Red Norland, Itasca, NorDonna, Snowden, and NY102 were smaller than most. Tubers of most lines had good general appearance; however, scab was a problem at this site (Maine Table 12). Katahdin, Kennebec, AF1437-1, AF1480-5, AF1615-1, B0766-3, NY102, and NY103 had more than 35% scab. Chieftain and AF1437-1 had more than 5% growth-cracked tubers. Superior had greater than 10% hollow heart out of 40 large tubers examined. Snowden, B0766-3, and NY102 had better chip color scores than Atlantic. B0811-13 was the best tablestock prospect in this test. B0766-3 and NY102 performed well for chipping, except for high scab incidence.

In the russet or long-type variety test, A84118-3 was very late maturing, and Russet Burbank, Century Russet, Russet Norkotah #3, A81386-1, A84180-8, A86102-6, and AO82611-7 were late maturing. Russet Norkotah #8, and AO82611-7 had significantly higher total yields than Russet Burbank (Maine Table 13). A84118-3, B1004-8, CO083008-1, and W1099Rus were significantly lower yielding. Russet Norkotah and AO82611-7 had significantly higher U.S.#1 yields than Russet Burbank. A84118-3, A84180-8, A86102-6, and B1004-8 had particularly small tuber size. CO083008-1 had higher specific gravity than Russet Burbank, while Russet Norkotah, A81386-1, and W1099Rus had specific gravities that were ≤ 1.080 . Tubers of Russet Norkotah #8 and A84180-8 were particularly attractive (Maine Table 14). Shepody had the highest incidence of sunburn, misshapen, scabby, and hollow tubers in the trial. Russet Burbank, AO82611-7, and W1099Rus had more than 20% misshapen tubers. A84180-8, B1004-8, and CO083008-1 had more than 5% growth-cracked

tubers. Century Russet, Russet Norkotah #3, Russet Norkotah #8, Shepody, A81386-1, B1004-8, and W1099Rus had more than 20% scabby tubers. CO083008-1 had 7.5% hollow heart in large tubers, while Century Russet, Russet Norkotah, and AO82611-7 had 5%. Only Century Russet had significantly poorer chip color scores than Russet Burbank. Overall, A84180-8 (table/proc.), A86102-6 (table/proc.), and AO82611-7 (proc.) were the best prospects in this trial. The two new Russet Norkotah clones were later maturing than the standard and slightly higher yielding; however, they displayed much greater scab susceptibility.

French Fry Processing from the 1997 Aroostook Research Farm Test. French fry color and texture of eight NE184 lines were evaluated under simulated processing conditions (Maine Table 15). Overall, none of the test lines produced french fries that were equal to Russet Burbank in quality. Texture scores for Century Russet, Shepody, B1004-8, and B9922-11 were statistically equal to those of Russet Burbank.

Aroostook Research Farm Small-scale Storage Evaluations. Limited data on storage and processing characteristics were collected from 39 NE184 varieties and clones during the 1997-98 storage season (Maine Table 16). Chip colors from 50°F storage in February were acceptable for many lines with anticipated chipping potential. Lines with outstanding chip color from 50°F February storage were: Atlantic, Itasca, Kennebec, Monona, and AF1424-7 (early test); Niska, NorValley, AF1433-4, B0766-3, and NY102 (medium trial). Lines which produced good chip colors directly from 45°F storage were: Atlantic, Kennebec, Monona, and AF1424-7 (early test); MaineChip, Niska, NorValley, Snowden, AF1433-4, and NY102 (medium test). Only AF1424-7 produced good chips directly out of 38°F storage; however, Kennebec, MaineChip, Niska, Reba, Snowden, AF1424-7, AF1433-4, B0766-3, NY102, and NY103 reconditioned well from 38°F storage. Reba, NY102, and NY103 provided good chip colors through late May evaluations.

After-cooking darkening scores are presented in Maine Table 16. Only Russet Burbank received poor color scores. Sloughing was observed in MaineChip. Washed

appearance ratings were particularly outstanding for Dark Red Norland, B0811-13, B1004-8, B9922-11, and NY103.

Itasca, Kennebec, Russet Burbank, Yukon Gold, AF1437-1, B0811-13, B0856-4, NY102, and NY103 required at least 193 days to reach the one-half-inch sprout stage. Selections with very low weight loss (3.5% or less) from 38°F storage were: Russet Burbank and Yukon Gold. Selections with very low weight loss (9% or less) from 50°F storage were: Century Russet, Itasca, Russet Burbank, Russet Norkotah, Yukon Gold, B0811-13, and B9922-11. Selections with high weight loss (25% or more) from 50°F storage were: Dark Red Norland, MaineChip, Reba, Snowden, AF1433-4, AF1565-12, B0564-8, and W1099Rus.

Promising Selections in the 1998 NE184 Regional Variety Trials. Selections that performed particularly well in the 1998 regional trials were AF1437-1 (an early maturing, table line); B0811-13 (red-skinned, yellow-fleshed table line); Niska, B0766-3, and NY102 (mid-season chipstock lines); Itasca and NY103 (mid-season table lines); Century Russet (very late maturing, table russet); A84180-8 and AO82611-7 (mid.- to late-season; table and processing russets).

Maine Table 1. Trials sites and management practices for the 1998 potato variety trials.

Site information and/or Mgt. Practices	Aroostook Research Farm	Central Maine	Northern Aroostook County
Location:	Presque Isle	Exeter	St. Agatha
Grower Cooperator:	n/a	Crane Farms	LaBrie Farms
Soil Test Results:			
pH	5.6	6.0	5.7
P (lbs/A)	20.8	32.6	28.1
K "	405 (8.0%)	271 (4.2%)	289 (4.3%)
Mg "	316 (20.1%)	262 (13.2)	320 (14.6%)
Ca "	1765 (68.3%)	2725 (82.6%)	3117 (74.6%)
CEC meq/100g	6.5	8.2	9.9
Previous Crop:	barley	corn	oats
Fall Tillage:	none	soil-saver	plow
Spring Tillage:	soil-saver, 2X	chisel plow	soil- finisher
Planting Date:	May 12-13	May 27	May 15
At-planting Insectic.:	imidacloprid 1 pt/A	imidacloprid 1 pt/A	none
At-plant Fertilization:	150-150-150	140-150-140	161-161-161
Other Fertilization:	none	50 lbs/A N and 140 lbs/A K, topdressed	40 lbs/A N as am.nitr., topdressed
Herbicide Program:	0.38 metrib.+ 1.5 pts/A pq., GCK 0.023 rimsulf., EPOST	linuron, PE	0.25 met., plus 0.016 rimsulf., GCK
Irrigation:	No	Yes (5 inches)	No
Vine Desiccation: (initial applic.)	Aug. 24 (E/ME) Aug. 31 (meds.) Sept. 8 (lates + russets)	Sept. 11	Sept. 2
Harvest:	Sept. 14 (E/ME) Sept. 21 (meds.) Sept. 28 (lates + russets)	Oct. 7	Sept. 29

Maine Table 2. 1998 Rainfall Summary.

Month	<u>Rainfall by Location and Month (inches)</u>		
	Presque Isle	Exeter ¹	St. Agatha
May	3.71	4.11	n/a
June	3.28	5.84	1.80
July	5.50	3.41(4.41)	3.20
August	2.48	1.39(4.39)	3.70
Sept.	3.06	1.88(2.88)	n/a
Total	18.03	16.63(21.63)	n/a
Total (June 1 to August 31)	11.26	10.64(14.64)	8.70

¹Rainfall data is from a weather station in Newport, Maine; approximately 11 miles from the Exeter field site. The Exeter site received approximately five inches of supplemental irrigation water during 1998. The numbers in parentheses indicate combined rainfall and supplemental irrigation.

Maine Table 3. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for 10 early- and medium-early-maturing, white- and red-skinned varieties grown at Presque Isle, Maine - 1998. (NE184 Regional Potato Variety Trials)

Variety	Total Yield cwt/A	US#1 Yield (cwt/A) ¹ >1 ⁷ / ₈ " % of std.	% Stand (spacing) ² >2 ¹ / ₄ "	50% Emerg. Date	Size Distribution by Class ³ (%)											Spec. Grav.	
					1	2	3	4	5	6	1 ⁷ / ₈ to 4"	2 ¹ / ₄ to 4"	2 ¹ / ₂ to 4"				
<u>Early/Medium-early Test - 103 days</u>																	
<u>Round-whites:</u>																	
Superior (std)	429	399	100	352	99(10)	6-5	2	12	31	49	6	0	98	86	55	1.083	
Atlantic	424	379	95	316	99(10)	6-8	3	16	28	40	11	1	96	80	51	1.093	
Itasca	460	414	104	295	100(10)	6-11	8	27	39	23	3	0	92	65	25	1.082	
Monona	346	321	80	279	97(10)	6-9	3	13	27	49	9	0	97	84	57	1.072	
AF1437-1	427	393	99	315	100(10)	6-12	3	20	37	39	1	0	97	77	40	1.066	
AF1565-12	392	339	85	280	100(10)	6-7	4	17	29	47	3	0	96	79	51	1.072	
<u>Reds :</u>																	
Chieftain (std)	518	480	100	388	98(10)	6-8	6	18	31	41	4	0	94	76	45	1.072	
Norland, DR	378	351	73	276	92(10)	6-6	6	21	44	27	2	0	94	73	29	1.068	
NorDonna	298	262	55	178	98(10)	6-8	10	29	36	23	2	0	89	60	25	1.071	
B0811-13	365	341	71	281	98(10)	6-7	5	17	28	43	7	0	95	78	50	1.073	
W. Duncan LSD	63	55	58								3	7			9	0.004	

¹U.S.#1 yield = yield 1⁷/₈ to 4" excluding external defects.

²Inches between seedpieces noted within parentheses.

³Size classes: 1=1¹/₂ to 1⁷/₈"; 2=1⁷/₈ to 2¹/₄"; 3=2¹/₄ to 2¹/₂"; 4=2¹/₂ to 3¹/₄"; 5=3¹/₄ to 4"; 6=over 4".

Maine Table 4. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip colors for 10 early- and medium-early-maturing, white- and red-skinned varieties grown at Presque Isle, Maine - 1998. (NE184 Regional Potato Variety Trials)

Variety	Plant Data ¹			Tuber Data ¹		Tuber Defects (%)							Hollow	
	Size 7-15	Vine Matur. 8-19	Matur. at Vinekill	Skin Texture	Shape	Appearance	Total	Sun-burn	Mis-shapen	Growth cracks	Scab	Rot	Heart Rating ²	Chip Color ³
Early/Medium-early Test - 103 days														
Round-whites:														
Superior (std)	8	4	3.3	6	2	7	5.2	2.4	0.5	2.3	0.0	0.0	0	63
Atlantic	8	5	5.0	5	1	5	6.9	4.8	0.0	2.0	0.0	0.0	0	66
Itasca	8	5	3.8	6	2	6	1.4	0.9	0.1	0.5	0.0	0.0	0	62
Monona	7	5	4.0	7	2	7	4.0	4.0	0.0	0.0	0.0	0.0	0	66
AF1437-1	8	5	5.3	5	2	7	4.9	1.1	0.0	3.8	0.0	0.0	0	63
AF1565-12	6	4	3.3	7	3	8	10.1	7.3	0.0	2.8	0.0	0.1	0	51
Reds:														
Chieftain (std)	8	5	4.0	5	1	7mr	1.0	0.1	0.2	0.5	0.0	0.1	0	51
Norland, DR	6	4	3.3	6	2	5mr	1.3	0.8	0.2	0.2	0.0	0.1	0	60dr
NorDonna	8	7	5.0	5	1	7br	2.6	1.5	0.1	0.0	0.0	1.0	0	52
B0811-13	8	6	4.5	pyf 5sc	2	4dr	1.9	0.6	1.1	0.0	0.0	0.2	0	61

¹See standard NE184 rating system for key to codes. pyf=pale yellow flesh; yf = yellow flesh sc=scaley skin texture; br=bright red skin; dr=dark red skin; pr=medium-red skin; sp=salmon pink.

²Hollow heart rating equals the number of hollow tubers found per 40 large tubers cut and examined.

³Chip color from 50F -- Agtron M35 (higher values indicate lighter color): >60 acceptable; dr = dark vascular ring. The chipping date was December 8, 1998. Waller Duncan LSD (K=100) for chip color = 4.

Maine Table 5. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for 9 medium-maturing, chipping varieties and 5 late maturing varieties grown at Presque Isle, Maine - 1998. (NE184 Regional Potato Variety Trials)

Variety	Total Yield cwt/A	US#1 >1 7/8" % std.	Yield (cwt/A) ¹ >2 1/4" % (spacing) ²	50% Emerg. Date	Size Distribution by Class ³ (%)											Spec. 2 1/2 to 4" Grav.
					1	2	3	4	5	6	1 7/8 to 4"	2 1/4 to 4"	2 1/2 to 4"			
Medium Test- 111 days																
Atlantic (std)	469	439	100	393	96(10)	6-4	3	10	21	45	20	0	97	87	66	1.092
Kennebec	423	362	83	315	99(8)	6-6	4	12	22	50	9	3	93	81	60	1.081
MaineChip	325	267	61	117	98(10)	6-6	17	47	28	7	1	0	83	36	8	1.103
Niska	317	299	68	257	100(10)	6-7	3	13	34	44	5	0	97	83	49	1.080
Snowden	318	297	68	226	100(14)	6-7	5	23	33	34	4	0	95	72	39	1.091
B0564-8	389	363	83	265	97(10)	6-7	6	25	39	28	1	0	94	69	30	1.085
B0766-3	380	359	82	313	99(10)	6-8	3	12	25	47	12	0	96	84	59	1.086
NY102	387	367	84	285	100(10)	6-7	4	21	39	33	2	0	96	74	35	1.092
NY103	369	338	77	280	99(10)	6-8	4	16	28	43	9	0	96	80	52	1.076
W-D LSD (k=100)	47	52		45								4	6	8	0.005	
Late Test - 119 days																
Katahdin (std)	448	384	100	342	97(8)	6-7	4	10	19	45	18	4	92	82	62	1.081
Shepody	346	316	82	266	100(10)	6-10	3	15	30	42	9	0	97	81	51	1.083
Yukon Gold	426	386	100	349	93(8)	6-8	2	9	20	54	13	1	97	88	68	1.084
AF1480-5	338	286	74	235	96(8)	6-5	6	17	26	42	9	0	94	77	51	1.083
AF1615-1	422	291	76	229	100(10)	6-5	6	21	36	35	3	0	94	74	38	1.086
W-D LSD (k=100)	57	87		83								4	6	7	0.006	

¹U.S.#1 yield = yield 1 7/8 to 4" excluding external defects.

²Inches between seedpieces noted within parentheses.

³Size classes: 1=1 1/2 to 1 7/8"; 2=1 7/8 to 2 1/4"; 3=2 1/4 to 2 1/2"; 4=2 1/2 to 3 1/4"; 5=3 1/4 to 4"; 6=over 4".

Maine Table 6. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for 9 medium-maturing, chipping varieties and 5 late-maturing varieties grown at Presque Isle, Maine - 1998. (NE184 Regional Potato Variety Trials)

Variety	Plant Data ¹			Tuber Data ¹		Tuber Defects (%)					Hollow			
	Size 7-15	Vine Matur. 8-27	Matur. at Vinekill	Skin Texture	Shape	Appearance	Total	Sun- burn	Mis- shapen	Growth cracks	Scab	Rot	Heart Rating ²	Chip Color ³
Medium Test - 111 days														
Atlantic (std)	9	6	6.0	5	1	6	3.4	2.4	0.0	0.0	0.0	1.1	0	66
Kennebec	8	7	6.8	7	4	8	8.4	7.3	0.0	0.7	0.1	0.3	0	63
MaineChip	7	5	5.0	7	1	5	1.6	1.2	0.4	0.0	0.0	0.0	0	67
Niska	7	6	5.5	7	3	7	2.4	1.5	0.0	0.4	0.0	0.4	0	68
Snowden	7	7	6.5	5	1	5	1.1	0.6	0.5	0.0	0.0	0.0	0	65
B0564-8	9	5	5.8	5	1	6	1.1	0.3	0.3	0.0	0.0	0.6	0	66
B0766-3	7	6	5.5	6	2	5	1.6	0.8	0.0	0.0	0.0	0.8	0	66
NY102	8	6	6.3	6	1	7	1.1	0.6	0.0	0.4	0.0	0.0	0	66
NY103	8	5	5.5	7	2	8	4.9	4.3	0.0	0.3	0.0	0.2	0	64
Late Test - 119 days														
Katahdin (std)	8	7	6.8	8	2	8	7.5	5.6	0.2	0.0	0.0	1.7	0	51dr
Shepody	7	5	5.0	7	7	5	5.6	2.4	2.3	0.0	0.0	0.9	0	55ds
Yukon Gold	8	3	4.0	7	3	7	6.4	4.0	1.3	0.0	0.8	0.4	0	58ds
AF1480-5	6	7	6.3	6	3	6	10.4	1.0	0.5	0.0	0.0	9.0	0	62ds
AF1615-1	8	6	6.0	6	2	7	27.8	3.1	0.1	0.0	0.7	23.9	0	56dr

¹See standard NE184 rating system for key to codes. pyf=pale yellow flesh.

²Hollow heart rating equals the number of hollow tubers found per 40 large tubers cut and examined.

³Chip color from 50F -- Agtron M35 (higher values indicate lighter color): >60 acceptable; dr = dark vascular ring; ds=dark stem-end of tuber. The chipping dates were December 1 (med.) and 7 (lates), 1998. Waller Duncan LSD (K=100) for chip color = 2 (med.) and 5 (lates).

Maine Table 7. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for 14 russeted/processing varieties grown at Presque Isle, Maine - 1998. (NE184 Regional Potato Variety Trials)

Variety	Total Yield cwt/A	US#1 Yield (cwt/A) ¹ >1½" % of std.	Yield cwt/A	% Stand (spacing) ²	50% Emerg. Date	Size Distribution by Class ³ (%)										Spec. Grav.
						% by wt. % by length										
						1	2	3	4	5	8 oz.>12oz.	>3"	>3½"			
Russet/Processing Test - 119 days																
R. Burbank (std)	471	455	100	379	100(16)	6-5	17	39	27	11	6	44	17	80	66	1.085
Century R	368	350	77	299	100(16)	6-6	15	33	24	15	13	52	28	82	71	1.080
R. Norkotah	341	337	74	279	100(14)	6-5	17	43	29	9	1	40	11	81	66	1.072
R. Norkotah #3	363	347	76	293	100(14)	6-7	16	28	26	13	18	57	30	85	72	1.076
R. Norkotah #8	347	342	75	298	100(14)	6-7	14	40	25	13	8	46	21	84	72	1.072
Shepody	370	318	70	273	100(10)	6-7	14	38	23	13	11	48	24	81	71	1.081
A81386-1	327	303	67	239	99(16)	6-8	21	38	26	8	7	41	15	70	55	1.075
A84118-3	314	309	68	236	99(16)	6-17	24	55	19	2	0	21	2	66	43	1.090
A84180-8	366	360	79	297	100(16)	6-9	18	49	25	7	1	33	8	80	69	1.081
A86102-6	349	322	71	240	100(16)	6-8	25	48	15	9	3	27	12	64	42	1.085
AO82611-7	398	361	79	277	100(16)	6-7	23	43	21	8	5	34	13	73	59	1.088
B1004-8	322	317	70	213	98(14)	6-9	33	51	15	2	0	16	2	61	37	1.085
CO083008-1	331	329	72	270	100(16)	6-5	18	47	22	9	4	35	13	74	53	1.090
W1099Rus	330	315	69	286	100(16)	6-7	9	39	25	12	15	52	26	85	72	1.078
W. Duncan LSD	57	59	57	57								11	11	8	9	0.004

¹U.S.#1 for the russet/proc. varieties = yield > 1-1/2", excluding external defects, and yield > 4 oz. tubers, excluding external defects, respectively.

²Inches between seedpieces noted within parentheses.

³Size classes for russeted/processing varieties: 1= <4 oz; 2=4 to 8 oz.; 3=8 to 12 oz.; 4=12 to 16 oz.; 5= >16 oz.

Maine Table 8. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip colors for 14 russeted/processing varieties grown at Presque Isle, Maine - 1998. (NE184 Regional Potato Variety Trials)

Variety	Plant Data ¹		Tuber Data ¹		Tuber Defects (%)				Hollow					
	Size 8-19	Vine Matur. 9-2	Matur. at vinekill	Skin Texture	Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Scab	Rot	Heart Rating ²	Chip Color ³
Russet/Processing Test - 119 days														
R. Burbank (std)	8	7	7.0	3	7	4	3.5	0.2	3.1	0.0	0.0	0.1	0	59dr
Century R	8	7	6.5	4	7	5	4.8	0.1	3.2	1.2	0.0	0.2	0	48dr
R. Norkotah	6	4	2.8	3	6	6	1.1	0.7	0.0	0.0	0.0	0.5	0	61
R. Norkotah #3	7	8	6.8	3	6	5	4.4	1.1	2.4	0.0	0.0	1.0	0	51dr
R. Norkotah #8	8	6	5.0	3	7	7	1.5	0.2	0.7	0.0	0.0	0.6	0	56dr
Shepody	7	5	4.8	7	7	5	14.1	7.8	5.2	0.0	0.1	0.9	0	61
A81386-1	8	7	6.3	3	7	6	7.4	5.0	2.0	0.0	0.0	0.4	0	64
A84118-3	8	8	8.0	4	5	4	1.5	0.2	0.9	0.0	0.0	0.4	0	58dr
A84180-8	8	6	5.8	3	6	5	1.8	0.1	1.3	0.3	0.0	0.1	1	56dr
A86102-6	8	7	6.3	3	5	4	7.4	0.1	2.5	0.6	0.0	4.2	0	54dr
AO82611-7	8	6	5.5	3	7	4	9.3	2.6	6.5	0.0	0.0	0.3	0	60dr
B1004-8	8	5	5.5	2	6	5	1.4	0.3	0.0	0.8	0.0	0.4	0	57dr
CO083008-1	8	6	6.0	3	5	5	0.7	0.3	0.0	0.0	0.0	0.5	1	65ds
W1099Rus	8	5	4.8	2	7	6	4.5	0.1	3.9	0.2	0.0	0.4	0	62

¹See standard NE184 rating system for key to codes.

²Hollow heart rating equals the number of hollow tubers found per 40 large tubers cut and examined.

³Chip color from 50F -- Agtron M35 (higher values indicate lighter color): >60 acceptable; dr=dark vascular ring; ds=dark stem-end of tuber. The chipping date was December 7, 1998. Waller Duncan LSD (K=100) for chip color = 5.

Maine Table 9. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for 17 varieties and lines grown at Exeter, Maine - 1998. (NE184 Regional Potato Variety Trial)

Variety	Total Yield cwt/A	US#1 Yield (cwt/A) ¹ >1 ⁷ / ₈ " % of std.	Stand (spacing) ²	Size Distribution by Class ³ (%)											Spec. 2 ¹ / ₂ to 4" Grav.	
				1	2	3	4	5	6	1 ⁷ / ₈ to 4"	2 ¹ / ₄ to 4"	2 ¹ / ₂ to 4"				
Central ME Regional Test- 107 days																
Atlantic (std)	401	298	100	284	96(10)	6	4	31	30	27	0	93	89	57	1.094	
Itasca	435	363	122	331	96(10)	8	8	41	31	11	0	92	84	42	1.077	
Katahdin	487	319	107	298	97(8)	6	6	29	43	16	0	94	88	59	1.081	
Kennebec	532	279	94	264	99(8)	5	5	28	39	22	0	95	89	61	1.081	
MaineChip	325	218	73	141	99(10)	31	25	39	5	0	0	69	45	5	1.101	
Monona	345	274	92	257	94(10)	8	6	34	36	15	1	92	86	52	1.069	
Niska	422	363	122	338	100(10)	6	6	36	35	15	1	93	87	50	1.082	
Snowden	383	311	104	275	100(14)	12	10	43	24	10	0	88	77	34	1.098	
Superior	328	237	80	215	98(10)	8	8	44	31	9	0	92	84	40	1.079	
Yukon Gold	471	381	128	350	99(8)	7	7	23	40	20	2	91	84	60	1.089	
AF1424-7	345	291	98	272	98(10)	7	6	42	36	9	0	93	87	45	1.085	
AF1437-1	392	335	112	313	97(10)	7	6	36	33	16	0	92	86	50	1.066	
AF1615-1	504	381	128	353	99(10)	8	7	35	32	16	2	90	84	48	1.083	
B0564-8	367	324	109	297	98(10)	9	8	54	20	9	0	91	83	29	1.081	
B0766-3	440	362	122	348	99(10)	5	4	23	35	33	1	95	91	68	1.085	
NY102	446	384	129	355	96(10)	7	7	38	34	14	0	93	85	48	1.087	
NY103	459	349	117	333	95(10)	4	5	27	38	26	1	95	90	64	1.077	
Waller Duncan																
LSD (k=100)	71	88		83								4	6	10	0.004	

¹U.S.#1 yield = yield 1⁷/₈ to 4" excluding external defects.

²Inches between seedpieces noted within parentheses.

³Size classes: 1=1¹/₂ to 1⁷/₈"; 2=1⁷/₈ to 2¹/₄"; 3=2¹/₄ to 2¹/₂"; 4=2¹/₂ to 3¹/₄"; 5=3¹/₄ to 4"; 6=over 4".

Maine Table 10. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for 17 varieties and lines grown at Exeter, Maine - 1998. (NE184 Regional Potato Variety Trial)

Variety	Plant Data ¹			Tuber Data ¹		Tuber Defects (%)					Hollow			
	Size	Vine	Matur.	Skin	Shape	Appear-	Total	Sun-	Mis-	Growth	Scab	Rot	Heart	Chip
	7-22	Matur.	at	Tex-		ance		burn	shapen	cracks			Rating ²	Color ³
		8-18	Vinekill	ture										
Central ME Regional Test- 107 days														
Atlantic (std)	7	6	4.8	5	2	5	19.9	5.2	8.9	0.9	4.7	0.1	0	58ds
Itasca	9	5	2.8	7	3	7	9.3	1.0	7.4	0.5	0.1	0.3	1	55dr
Katahdin	7	7	5.0	7	2	5	30.4	14.4	5.2	0.2	10.3	0.3	2	45dr
Kennebec	9	6	5.0	7	4	8	45.1	17.8	13.4	0.3	13.4	0.1	0	51dr
MaineChip	7	5	3.8	7	2	4	3.4	0.9	2.6	0.0	0.0	0.0	0	68
Monona	5	5	4.0	7	4	3	14.2	5.7	7.6	0.0	0.6	0.4	0	60dr
Niska	8	5	4.3	7	3	5	7.6	3.6	3.1	0.8	0.0	0.1	0	66
Snowden	9	8	5.3	5	2	5	7.6	1.7	4.3	0.1	1.2	0.3	0	64
Superior	8	4	1.8	7	2	8	22.2	4.5	15.5	1.0	0.4	0.8	0	55dr
Yukon Gold	8	4	1.8	7	3	8	11.1	3.5	5.4	0.3	1.8	0.0	0	47dr
AF1424-7	7	5	3.0	7	2	8	10.3	4.0	4.6	0.3	1.2	0.2	0	66
AF1437-1	7	6	3.8	6	2	6	7.4	1.4	1.7	2.1	1.9	0.2	0	45dr
AF1615-1	8	7	5.0	7	3	7	16.2	8.5	6.9	0.0	0.6	0.2	0	48dr
B0564-8	9	5	2.0	6	1	7	2.8	0.7	1.7	0.0	0.3	0.1	0	59
B0766-3	7	7	5.5	6	2	6	13.3	2.8	10.0	0.1	0.3	0.1	0	66
NY102	9	7	5.0	7	1	7	7.5	5.4	2.0	0.1	0.0	0.0	0	64ds
NY103	8	7	4.0	7	3	8	20.7	7.4	11.5	1.3	0.2	0.3	0	60ds

¹See standard NE184 rating system for key to codes.

²Hollow heart rating equals the number of hollow tubers found per 40 large tubers cut and examined.

³Chip color from 50F -- Agtron M35 (higher values indicate lighter color): >60 acceptable; dr = dark vascular ring; ds=dark stem end. The chipping date was December 3, 1998. Waller Duncan LSD (K=100) for chip color = 4.

Maine Table 11. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for 19 round-white and red-skinned varieties and NE-184 regional trial lines grown at St. Agatha, Maine - 1998. (NE184 Regional Potato Variety Trials)

Variety	Total Yield cwt/A	US#1 Yield (cwt/A) ¹ % Stand >1 ⁷ / ₈ " % of std.	6-30 (spacing) ²	Size Distribution by Class ³ (%)													Spec.
				1	2	3	4	5	6	1 ⁷ / ₈ to 4"	2 ¹ / ₄ to 4"	2 ¹ / ₂ to 4"	4"				
St. Agatha NE-184 Round-whites and Reds - 115 days																	
Round-whites:																	
Atlantic (std)	387	230	100	219		96 (10)	5	4	26	26	37	2	93	89	63	1.096	
Itasca	364	263	114	239		98 (10)	8	9	45	29	10	0	92	84	39	1.082	
Katahdin	423	166	72	155		83 (8)	5	5	31	37	22	0	94	89	58	1.085	
Kennebec	430	140	61	136		92 (8)	4	3	22	44	27	1	96	93	71	1.084	
Snowden	317	236	103	215		99 (14)	8	8	41	32	11	0	92	84	43	1.100	
Superior	384	311	135	304		99 (10)	2	2	24	41	30	1	97	94	71	1.090	
Yukon Gold	381	199	87	189		92 (8)	6	5	30	39	19	1	93	88	58	1.092	
AF1437-1	367	81	35	76		97 (10)	5	6	35	35	18	0	95	88	53	1.068	
AF1480-5	361	116	50	108		94 (10)	6	5	35	37	17	0	94	89	54	1.084	
AF1565-12	323	227	99	208		95 (10)	6	8	35	38	13	0	94	86	51	1.076	
AF1615-1	426	85	37	78		98 (10)	5	6	35	36	18	0	95	89	54	1.087	
B0564-8	378	316	137	301		98 (10)	7	5	32	34	23	0	93	88	57	1.089	
B0766-3	351	161	70	156		91 (10)	4	3	24	35	34	1	96	93	68	1.092	
NY102	356	200	87	186		91 (10)	6	7	39	34	14	0	94	87	48	1.092	
NY103	366	157	68	147		94 (10)	4	6	31	41	18	0	96	90	59	1.080	
Reds:																	
Chieftain (std)	448	261	100	236		96 (10)	9	9	34	35	14	0	91	82	49	1.076	
NorDonna	347	277	106	243		96 (10)	14	11	42	20	13	0	86	75	33	1.075	
Norland,DR	302	184	70	161		92 (10)	13	12	44	23	8	0	87	75	31	1.074	
B0811-13	389	316	121	295		99 (10)	7	6	30	28	29	1	92	86	56	1.081	
Waller Duncan																	
LSD (k=100)	54	140		134									3	5	10	0.004	

¹U.S.#1 yield = yield 1⁷/₈ to 4" excluding external defects.

²Inches between seedpieces noted within parentheses.

³Size classes: 1=1¹/₂ to 1⁷/₈"; 2=1⁷/₈ to 2¹/₄"; 3=2¹/₄ to 2¹/₂"; 4=2¹/₂ to 3¹/₄"; 5=3¹/₄ to 4"; 6=over 4".

Maine Table 12. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for 19 round-whites and red-skinned varieties and NE-184 regional trial lines grown at St. Agatha, Maine - 1998. (NE184 Regional Potato Variety Trials)

Variety	Plant Data ¹			Tuber Data ¹			Tuber Defects (%)				Hollow					
	Size 7-22	Vine Matur. at 8-20 Vinekill	Matur. ture	Skin Tex-	Shape	Appear- ance	Total burn	Sun- burn	Mis- shapen	cracks	Growth	Scab	Rot	Heart Rating ²	Chip Color ³	
St. Agatha NE-184 Round-whites and Reds - 115 days																
Round-whites:																
Atlantic (std)	8	6	5.3	5	1	7	34.9	3.7	9.1	4.7	17.5	0.0	1	55dr		
Itasca	8	6	5.3	6	1	7	23.0	0.7	6.1	0.1	15.9	0.1	0	45dr		
Katahdin	7	7	5.8	7	2	7	56.3	7.8	3.2	0.6	44.7	0.0	0	n/a		
Kennebec	8	5	5.0	7	3	5	67.8	5.3	3.5	0.9	58.1	0.0	0	47dr		
Snowden	7	6	4.5	6	2	6	18.3	0.6	7.3	0.5	10.0	0.0	0	62		
Superior	8	4	3.0	5	2	8	16.6	0.5	9.0	0.5	6.7	0.0	4	n/a		
Yukon Gold	9	4	2.5	7	3	7	42.8	1.7	9.5	0.5	30.6	0.4	0	n/a		
AF1437-1	7	5	4.0	5	2	7	76.5	0.4	1.4	6.8	67.7	0.2	0	n/a		
AF1480-5	8	7	6.0	6	3	8	66.3	4.5	3.9	0.1	57.7	0.0	1	n/a		
AF1565-12	6	4	4.0	7	2	6	24.5	3.3	7.5	1.6	11.5	0.6	0	n/a		
AF1615-1	7	7	5.3	6	2	7	79.5	3.2	2.1	0.0	74.0	0.1	0	n/a		
B0564-8	8	6	4.5	5	1	6	9.9	0.2	1.6	0.0	8.1	0.0	1	57		
B0766-3	7	7	6.3	7	1	8	50.7	1.9	9.1	0.0	39.8	0.0	0	62		
NY102	8	5	4.5	8	2	6	42.0	1.2	3.1	0.5	37.1	0.0	1	60dr		
NY103	7	6	5.0	7	2	6	56.4	6.5	6.7	0.6	42.3	0.3	1	58		
Reds:																
Chieftain (std)	8	5	4.3	7	3	7br	35.3	1.0	3.2	6.5	24.4	0.2	1	n/a		
NorDonna	8	6	5.5	7	1	8dr	7.6	0.6	1.9	0.0	5.2	0.0	0	n/a		
Norland, DR	5	3	1.5	7	2	6dr/sp30.7	1.1	1.1	3.1	1.5	25.0	0.0	0	n/a		
B0811-13	7	5	3.8	pyf	5sc	1	7dr	12.4	2.6	9.0	0.3	0.5	0.0	0	n/a	

¹See standard NE184 rating system for key to codes. pyf=pale yellow fleshed; br=bright red skin; dr=dark red skin; sp=pale red/salmon pink; sc=scaley skin.

²Hollow heart rating equals the number of hollow tubers found per 40 large tubers cut and examined.

³Chip color from 50F -- Agtron M35 (higher values indicate lighter color): >60 acceptable. The chipping date was December 8, 1998. Waller Duncan LSD (K=100) for chip color = 4.

Maine Table 13. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for 14 russet/processing (long-tuber-type) varieties and NE-184 regional trial lines grown at St. Agatha, Maine - 1998. (NE184 Regional Potato Variety Trials)

Variety	Total Yield cwt/A	US#1 Yield >1½" % of std. 4 oz.	% Stand (spacing) ² 6-30	Size Distribution by Class ³ (%)													Spec. Grav.
				by length													
				1	2	3	4	5	8 oz	12 oz.	>	>3"	>3½"				
<u>St. Agatha NE-184 Russet/processing Test- 115 days</u>																	
R. Burbank (std)	402	223	100	198	100 (16)	12	37	25	14	12	51	27	83	68	1.088		
Century R.	379	227	102	201	97 (16)	11	35	25	19	11	55	30	86	74	1.083		
R. Norkotah	421	362	162	311	100 (14)	14	43	26	11	6	43	17	81	64	1.077		
R. Norkotah #3	443	250	112	230	99 (14)	8	32	32	15	12	60	28	88	65	1.084		
R. Norkotah #8	455	260	117	234	99 (14)	9	34	30	13	14	57	28	88	75	1.082		
Shepody	416	0	0	0	95 (10)	8	31	25	17	18	60	35	88	78	1.083		
A81386-1	399	219	98	189	100 (16)	13	35	32	14	7	52	20	77	61	1.080		
A84118-3	306	250	112	199	93 (16)	20	53	22	5	0	27	5	74	54	1.084		
A84180-8	383	327	147	285	93 (16)	13	56	26	4	1	31	4	85	72	1.085		
A86102-6	441	348	156	293	100 (16)	16	47	28	7	2	37	9	74	52	1.085		
AO82611-7	467	364	163	300	100 (16)	17	40	23	9	11	43	20	75	60	1.087		
B1004-8	320	202	91	147	96 (14)	29	55	14	2	1	17	3	63	39	1.082		
CO083008-1	353	277	124	248	100 (16)	10	44	26	12	7	45	19	82	61	1.091		
W1099Rus	320	162	73	145	93 (16)	9	32	19	20	19	59	40	85	72	1.079		
<u>Waller Duncan</u>																	
LSD (k=100)	46	132		117							11	9	5	13	0.003		

¹U.S.#1 yield = yield >1 1/2 " excluding external defects.

²Inches between seedpieces noted within parentheses.

³Size classes: 1= <4 oz; 2=4 to 8 oz.; 3=8 to 12 oz.; 4=12 to 16 oz.; 5= >16 oz.

Maine Table 14. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for 14 russet/processing (long-tuber-type) varieties and NE-184 regional trial lines grown at St. Agatha, Maine - 1998. (NE184 Regional Potato Variety Trials)

Variety	Plant Data ¹			Tuber Data ¹			Tuber Defects (%)					Hollow		
	Size 7-22	Vine Matur. 8-20	Matur. at vinekill	Skin Tex- ture	Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Scab	Rot	Heart Rating ²	Chip Color ³
St. Agatha NE-184 Russet/processing Test- 115 days														
R. Burbank (std)	7	7	7.0	4	6	6	43.9	0.1	31.7	1.0	11.0	0.3	1	42dr
Century R.	7	7	6.8	4	6	6	40.8	2.6	11.5	3.9	22.4	0.4	2	29dr
R. Norkotah	7	4	3.8	3	5	7	13.8	1.1	9.1	0.8	2.7	0.0	2	50dr
R. Norkotah #3	8	7	7.3	3	6	7	45.7	1.0	9.5	0.8	34.4	0.0	2	40dr
R. Norkotah #8	8	6	6.3	3	5	8	45.2	1.2	7.4	0.0	37.0	0.1	1	42dr
Shepody	7	5	5.0	7	6	3	100	4.8	10.7	0.7	83.9	1.8	0	42dr
A81386-1	7	7	6.8	4	4	7	45.0	6.4	9.6	0.0	29.2	0.2	0	57
A84118-3	6	8	8.0	3	5	5	18.2	0.8	15.0	0.3	2.0	0.0	0	42dr
A84180-8	7	8	6.5	4	6	6	14.9	0.3	8.2	5.9	0.0	0.4	0	44dr
A86102-6	8	8	6.3	4	5	7	21.0	1.4	16.7	2.6	0.2	0.1	0	38dr
AO82611-7	8	7	6.5	4	6	7	22.6	1.0	20.2	0.8	0.0	0.6	2	48dr
B1004-8	7	5	4.8	2	5	7	40.5	0.0	2.3	5.7	32.6	0.0	0	52dr
CO083008-1	6	6	5.5	3	6	6	21.3	0.5	10.9	7.7	2.3	0.0	3	56
W1099Rus	6	6	5.5	2	6	6	49.1	0.9	22.3	2.4	23.6	0.0	0	49

¹See standard NE184 rating system for key to codes.

²Hollow heart rating equals the number of hollow tubers found per 40 large tubers cut and examined.

³Chip color from 45 and 50F -- Agtron M35 (higher values indicate lighter color): >60 acceptable; dr=dark vascular ring defects in the chips. The chipping date was December 9, 1998. Waller Duncan LSD (K=100) for chip color = 6.

Maine Table 15. French fry color and texture of selected potato clones and varieties under simulated processing conditions¹. All varieties were grown at Presque Isle, Maine, during 1997.

Variety	Color Grade ² Rating Index	Grayness ³ Index	Mealiness ⁴ Index	Comments ⁵	Overall Rating ⁶
Russet Burbank (std)	00 -1 2.22	4.0	4.42	U	-
Century Russet	000-4 2.35	4.0	3.89	U	-
Russet Norkotah	00 -4 3.62	3.6	3.55	Ir	-
Shepody	0 -4 3.43	3.7	4.18	Be, Ir	-
B1004-8	0 -2 2.25	4.0	4.82	Ir	-
B9922-11	00 -4 3.99	3.6	4.15	Ir	-
W1099Rus	0 -4 4.65	4.0	3.42	Ir, Be	-
Waller Duncan LSD (k=100)	2.03	NS	0.54		

¹Two center raw tuber slices were cut from each of ten tubers. The slices were rinsed in cool water, blanched for 8 minutes at 170°F, par-fried at 375°F for 80 seconds, and quick frozen at -30°C in plastic bags. Four such replications were processed on December 5, 1997 and held at -15°F until evaluation. Prior to evaluation, samples were finish-fried at 360°F for 2-1/2 minutes on March 11, 1998, blotted dry with a paper towel, and cooled for 6 minutes. Processing and evaluations were done at the Department of Food Science, University of Maine, Orono, ME (We appreciate the help of Dr. Al Bushway). All tuber samples were stored at 50°F, 85% R.H. from harvest until processing.

²Color Grades are from USDA color standards chart #64-1, third edition. Lower indices indicate lighter color.

³Grayness indices represent weighted means derived from the following evaluation scale: 4 = no graying;

3 = slight graying; 2 = moderate graying; 1 = intense graying.

⁴Mealiness indices represent weighted means derived from the following evaluation scale: 5 = dry, mealy; 4 = mod. mealy, sl. moist; 3 = sl. mealy, mod. moist; 2 = soggy, not mealy; 1 = very soggy, not mealy.

⁵Comments: U = uniform fried color; Ir = french fries were irregular in color; dark blotches detracted from appearance of product; Be = Dark blotches on ends of many fries; Bc = Dark blotches in centers of many fries; Bl = general blotchy appearance of fries; Sh = Short fries from small and/or round tubers.

⁶Overall rating: quality rated better (+), not different (o), or poorer (-) than Russet Burbank.

Maine Table 16. Chip color from 38°F, 45°F, and 50°F storage, reconditioning potential, washed appearance ratings, days to sprout formation, and storage weight losses at 38°F and 50°F for 39 potato varieties grown at Presque Isle, Maine, during 1997 and stored during the 1997-1998 storage season.

Variety	Chip Color from Storage		After-Cooking Darkening ³	Washed Appearance Index ⁴	Days to Indic. Storage Wt.					
	50°F ¹	45°F ¹			38°F ¹	Recond. ²	Sprout Length ⁵	Loss % ⁶		
							PIP	1/2"	38°F	50°F
Early/Med. Early Trial:										
Superior (std)	63	62	40	60	8.4	90 (7) SS	68	166	4.6	11.5
Atlantic	68	64	46	62	8.8	83 (7) SZ, B	89	180	5.5	11.0
Cherry Red	60	--	--	--	8.9	85 (7) PC, SZ, SS, RS	75	166	5.2	14.8
Chieftain	42	--	--	--	8.9	92 (6) PC, SS	68	187	4.8	15.8
Itasca	70	63	41	63	8.9	50 (6) SZ, SS, SK	68	222	4.9	7.9
Kennebec	69	64	44	64	8.9	92 (7) SS, BS, B	68	201	4.9	10.1
Monona	70	65	44	62	8.9	78 (4) PC, SS	68	187	4.6	11.1
NorDonna	52	--	--	--	8.8	80 (7) SZ, SS	96	152	5.1	15.1
Norland, Dark Red	61	--	--	--	8.7	89 (8) SS, B	124	166	5.9	28.3s
Quaggy Joe	44	--	--	--	8.6	85 (2) PC, GC, BS, LR, B	82	145	6.6	13.8
Red Ruby	46	--	--	--	8.9	88 (7) SZ, SS	82	166	6.7	9.4
AF1424-7	70	68	62	68	8.6pc	83 (3) PC, SB, SS, BS, RS, SZ	68	180	8.6	16.5
AF1437-1	61	51	23	41	8.4	90 (6) PC, SS, SZ, B	145	208	5.7	14.3
AF1565-12	60	43	30	40	8.4	59 (3) PC, SS, SZ, BS	68	131	8.3	26.7s
B0811-13	65	56	35	42	8.8yf	84 (8) SS, SZ, SCL	110	208	4.2	8.5
Waller Duncan LSD	4	5	4	4						
Medium Chipping Trial:										
Atlantic (std)	61	58	48	56	8.4	83 (7) SS, SZ, B	95	172	5.7	24.6
Kennebec	66	59	46	59	8.6	94 (7) PC, SS, B	60	193	5.3	15.7
MaineChip	66	64	58	66	8.2sl	55 (3) PC, BD, SS, SZ	60	165	6.9	33.8s
Niska	70	66	50	67	8.6	75 (2) PC, CS, SZ, SS, BS	60	186	5.3	21.0
NorValley	68	64	57	63	8.6	65 (2) PC, SS, SZ, BS	60	151	5.9	23.8
Reba	65	63	52	65	9.0syl	80 (7) PC, SS, SZ	60	186	5.2	28.8
Snowden	64	65	60	66	8.6	52 (4) PC, BS, B, SZ	60	151	6.0	31.6
AF1433-4	70	66	51	66	9.0	46 (2) PC, SS, BS, SZ	60	165	4.2	25.4
B0564-8	60	55	40	55	8.5	84 (3) PC, SS, BS, SZ	67	165	7.2	25.4

Maine Table 16 cont.

Variety	Chip Color from Storage		After-Cooking Darkening ³	Washed Appearance Index ⁴	Days to Indic. Storage Wt.						
	50°F ¹	45°F ¹			38°F ¹	Recond. ²	Sprout Length ⁵	Loss % ⁶			
					PIP	½"	38°F	50°F			
Medium Chipping Trial - continued											
B0766-3	69	63	56	66	8.8sy1	92 (4)	PC.SS.BS.B.SZ	60	179	5.5	23.0
NY102	67	64	57	66	8.5	91 (5)	PC.SS.BD.SZ	60	200	7.3	20.2
NY103	63	61	44	64	8.6	91 (8)	SS.B.SZ	67	221	6.2	18.8
Waller Duncan LSD	3	5	5	3							
Late Trial:											
Katahdin	57	48	26	42	8.6	88 (4)	PC.RS.SZ.SS.B	60	165	4.8	11.2
Yukon Gold	52	--	--	--	9.0y1	91 (5)	PC.SS.BS.B	74	193	3.5	6.7
AF1480-5	56	51	35	51	8.6	96 (7)	PC.SS.B.BD	53	158	5.9	22.1s
AF1615-1	50	41	20	32	8.6	82 (7)	SS.B.SZ	60	179	5.4	11.5
B0856-4	52	43	22	32	8.8	78 (4)	PC.SS.B.SZ	53	193	6.4	11.4
Waller Duncan LSD	5	5	3	4							
Russet/Processing Trial:											
Russet Burbank	54	49	36	48	7.9	-- (7)	NR.SS.	53	193	3.5	8.5
Century Russet	45	44	28	35	8.9	-- (6)	NR.SZ.SS	60	179	5.3	6.1
R. Norkotah	42	41	30	42	8.4	-- (4)	SS.SZ.PR	53	165	5.7	9.0
Shepody	46	44	26	38	8.6	-- (6)	PC.SS.BS	81	158	4.3	12.6
B1004-8	55	51	39	49	8.9	-- (8)	CC.SZ	53	158	5.5	18.7
B9922-11	49	46	29	38	8.9	-- (8)	SS.B	53	158	12.5	6.7
W1099Rus	30	34	20	31	8.6	-- (7)	NR.SZ	53	130	11.4	31.9s
Waller Duncan LSD	8	6	6	6							

Maine Table 16 cont.

¹Stored at 38°F, 45°F, or 50°F, 85% R.H. from harvest until February 6 to 21, 1998 Chip color scores are from an Agtron Model M-35 Process Analyzer (Agtron, Inc., Sparks, Nevada; calibrated with black disk "0" = 0 and white disk "90" = 90). Chips were crushed and reported values are means from four replicate samples. Each sample was read three times and was thoroughly mixed between readings. Higher numbers indicate lighter chip colors.

²Reconditioned samples were taken from 38°F and placed at 70°F for a 3-week period starting on January 26, 1998. See Agtron description under footnote #1.

³Samples were stored at 45°F and 85% R.H. from harvest until April 5, 1998. They were then warmed to 65°F for five days. Tubers were diced and then blanched for 5 min, cooled to 120°F, and then rated after 30 min. with a Munsel Neutral Color Scale. Higher indices indicate lighter color. Key to codes: sl=sloughing was a defect in this sample; syl=slightly yellow; yl=yellow; pc=unusually poor overall color.

⁴Unreplicated samples weighing approximately 7500 grams were stored at 45°F and 85% R.H. until April 7, 1998. Tubers were then washed and graded. First number indicates % U.S.#1 grade tubers in sample. Numbers in parentheses indicate subjective appearance of the sample using standard NE184 codes. Codes indicate major external defects as follows: M=misshappen, NR=nonuniform russetting, PC=poor color, SB=sunburn, GC=growth cracks, CS=common scab, SS=silver scurf, RS=russet scab, DR=dry rot, SR=soft rot, BS=black scurf, LE=enlarged lenticles, B=bruises, BD=blackdot, PW=powdery scab, RA=red areas, PU=purple areas on seed end, SZ=small tuber size, FL=flat tubers, PR=pear shaped, SK=cracked skin; SCL=scaley skin.

⁵Tubers were stored at 45°F, 85% R.H.

⁶Percentage sprout and weight loss following storage from harvest until April 10 to 16, 1998 at indicated temperature and 85% R.H. Codes "s" or "r" indicate heavily sprouted or samples with more than two spoiled tubers, respectively.

MAINE

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University of Maine

Potato Breeding Project

Objectives: The development of new potato varieties of three types: 1. round white fresh market varieties with good table qualities and resistance to scab; 2. round white chipping varieties with high dry matter and low sugars, especially after long term cold storage; and 3. russet varieties suitable for french fry processing and fresh market.

Seed and seedling production: A total of 56 parent plants were intercrossed in 129 different combinations (59 russet, 37 tablestock, 25 chipping, and 61 resistant to late blight) to produce 78,785 seeds. An additional 7,125,475 seeds were obtained from 93 field plantings. Greenhouse plantings of 186,025 true seeds yielded 50,315 seedlings from which 34,697 first tubers were harvested. Second tubers were harvested from 5,056 seedlings to be planted in disease screening plots. Round tubers harvested in russet combinations were discarded; misshapen tubers were discarded from all crosses.

Seedling selection: A total of 336 new selections were saved from 20,379 single hills (1.6%). From the 649 12-hill plots, 113 (17%) were saved for further testing. Thirty of 43 60-hill plots were selected, and 134 advanced selections were maintained and tested.

Disease tests: In cooperation with Drs. David Lambert, Gary Sewell, Bill Brodie, Robert Goth, Pete

Weingartner, and Modesto Olanya, all selections from the third field generation were tested for disease resistances. Six of nine selections were resistant to corky ringspot in Florida tests. Eight of forty-one selections were resistant to golden nematode in New York tests.

Scab tests consisted of two-hill plots replicated twice. Freshly cut seedpieces were dipped in inoculum just before planting. The inoculum was prepared by peeling scabby tubers and grinding the peelings in a meat grinder with deionized water. In the acid scab test, 34 of 44 selections tested showed some level of resistance. For common scab, 37 of 64 selections were resistant.

Verticillium plots were four-hill plots with two replications. Freshly-cut seedpieces were dipped in inoculum prepared from petri-dish grown verticillium cultures. Seven of 53 selections tested were resistant to verticillium.

Late blight tests were also replicated twice, but no inoculum was used. Natural infection always kills the test plot before frost (except in 1975). Only two of 90 selections tested had any level of resistance.

Leafroll inoculation was done by means of green peach aphids raised on potato plants infected with leafroll virus. Tubers were harvested and replanted for observation and ELISA testing the following year. Of thirty-four selections inoculated in 1997, five were resistant in the 1998 plantback plot.

Aphids were also used to transmit PVY to replicated test plots. Three of 31 selections inoculated in 1997 were resistant in 1998 plantbacks.

Physiological disorders: Fourth year selections were tested for hollow heart, shatter bruise, and blackspot bruise. These tests consisted of

five-hill plots replicated four times. Ten 8-10 ounce tubers were harvested from each plot, and in addition, all of the tubers over four inches in diameter were harvested from the hollow heart test. Six of 55 selections were resistant to hollow heart. Bruising was accomplished by dropping a 275 gram weight onto the potato from a height of 12 inches for shatter and 6 inches for blackspot. The shatter rating was made immediately; the blackspot after 24 hours. Five of 19 selections were resistant to blackspot bruising; and six of 26 to shatter bruising.

Chip tests: After processing in December and February, from five storage temperatures, twelve entries had better average chip color than Monona (5.9): AF 1668-60 (4.45), NY 102 (4.75), ND 860-2 (4.75), Andover (4.8), Snowden (4.8), MaineChip (4.8), AF 1668-62 (4.85), CS 7232-4 (4.9), Somerset (5.0), AF 1899-1 (5.5), AF 1898-2 (5.55), NY 103 (5.85).

Commercial Trials: Along with Sunrise, Mainstay, Quaggy Joe and St.Johns, one numbered selection was grown on a commercial farm in 1998: AF 875-15. This selection was grown for use in Virginia as a variety which will chip from the field like Atlantic, but does not have the heat necrosis so often a problem in Atlantic. AF 875-15 has also done well in small plot tests in New Jersey and Pennsylvania.

Chipping selections:

AF 1668-60 (CS 7232-4 open pollinated) has excellent chip color from cold storage, with adequate gravity and low yield. It is resistant to net necrosis and is early maturing with moderate resistance to verticillium.

AF 1775-2 (AF 901-1 x EB 8109-1) is

not as good a chipper from cold storage as Snowden, but has better chip color than Atlantic with similar yield and gravity. It is resistant to net necrosis and has a moderate reaction to late blight, verticillium and common scab.

AF 1856-1 (CF 80247-1 x EB 8109-1) has excellent chip color from storage and adequate gravity and yield. It is resistant to net necrosis, scab, and verticillium.

Round white table varieties:

Quaggy Joe (AF 1470-17; CS 7589-8 x Portage) is a very high-yielding variety with good appearance and table quality. Forty-three acres of seed were produced in 1998.

St.Johns (AF 828-5; BR 6317-21 x CC 14-3a) is a late maturing variety with high yields and good disease reactions. It is resistant to golden nematode and the corky ring-spot virus, and does well all along the east coast. It has a good washed appearance. Twenty-one acres of seed were produced in 1998.

AF 1437-1 (AF 686-3 x B 7168-10) is a pretty round white with very high yields at early or mid-season harvest. Some growth cracks have been seen.

AF 1470-6 (CS 7589-8 x Portage) is very high-yielding at early harvest, with low specific gravity. It is resistant to verticillium and net necrosis. There have also been some growth cracks in this selection.

AF 1565-12 (AF 303-5 x Sunrise) is a round white table variety with good size, appearance and yields. It is early maturing and resistant to golden nematode, verticillium and scab. Specific gravity is low and cooked texture is rated low, but overall ratings equal Superior.

AF 1569-2 (Portage x Sunrise) has high yields at early harvest in several locations. It is resistant to net necrosis, but susceptible to scab and growth cracks.

AF 1615-1 (SA 8211-6 x Sunrise) is a high-yielding medium-late maturing selection with resistance to net necrosis, golden nematode, scab and verticillium. It has high specific gravity but does not give good chip color after storage.

AF 1758-7 (AF 303-5 x CF 7608-19) has yielded better than standards at medium-late harvest. It is resistant to net necrosis, golden nematode, verticillium, common scab, acid scab, and has a moderate reaction to late blight and corky ringspot. It has low specific gravity and excellent boiling scores in Pennsylvania tests.

AF 1763-2 (CS 76123-36 x AF 686-3) is a medium to medium-early maturing selection with very high yields and medium to medium-low gravity. It is resistant to net necrosis, golden nematode, verticillium, and hollow heart.

Russets and Long Whites:

AF 1156-14 (Goldrus x Penobscot) has high yields and specific gravity with excellent french fry qualities. It is resistant to net necrosis, leafroll, and verticillium.

AF 1753-16 (CS 7981-7 x CF 7608-19) is a long russet with good shape, high yields, and fair processing quality.

Maine Breeding Table 1. Performance of some round white selections grown at Presque Isle, Maine, 1998.

Variety	Color ¹	Shape ²	Maturity ³	Yield, US1 ⁴	Yield, Total	%US1	Days ⁵	Specific Gravity	Appearance ⁶
AF 1437-1	WN	R	ME	356	362	98.3	89	1.073	4
AF 1470-6	W(N)	R, (fl)	E	387	394	98.2	89	1.068	3+
AF 1565-12	WN	RO, fl	E	313	325	96.3	89	1.084	3
AF 1569-2	CN	R	ME	337	358	94.1	89	1.084	4+
AF 1615-1	W	OR	M	366	373	98.1	110	1.092	4-
AF 1758-7	W(N)	R	ML	392	397	98.7	104	1.073	4-
AF 1763-2	WN	RO	ME	470	494	95.1	98	1.072	4
Katahdin	W	R	M	362	377	96.0	110	1.084	4
Kennebec	W	OR	M(L)	252	265	95.1	89	1.083	3
Ontario	W	R	L	458	469	97.7	110	1.085	3+
Superior	WN	R	E	307	316	97.2	89	1.090	3

1. Color: W = white; N = netted; C = cream. () = slight.

2. Shape: R = round; O = oblong; fl = flat.

3. Maturity: M = medium; E = early; L = late.

4. Yield in hundred-weight per acre, over 1-7/8" diameter.

5. Number of days from planting to first top-kill.

6. Appearance ratings from 1 = very poor to 5 = excellent.

Maine Breeding Table 2. Performance of some chipping and russet selections grown at Presque Isle, Maine, 1998.

Variety	Color ¹	Shape ²	Mat. ³	Yld, US1 ⁴	Yld, Tot.	%US1	Days ⁵	Spec. Grav.	App. ⁶	41F ⁷	45F ⁷	50F ⁷
AF 1668-60	WN	R	M(E)	304	314	96.8	98	1.090	4	6.75	3.40	3.25
AF 1775-2	W	OR	M(L)	372	388	95.9	104	1.091	4	9.20	7.25	6.10
AF 1856-1	W!	RO	E	321	337	95.3	98	1.086	4+	8.95	5.10	4.45
Katahdin	W	R	M	306	322	95.0	98	1.075	4-			
MaineChip	W	R	ME	328	350	94.0	108	1.104	3	7.55	4.15	3.30
Kennebec	W	R	ML	322	335	96.1	98	1.079	3+	9.45	6.90	6.00
						%Lg ⁸				Clr ⁹	Txt ⁹	Flv ⁹
AF 1156-14	R	RO	ME	314	327	66	119	1.099	3+	6.56	7.25	6.50
AF 1753-16	WN	L	ML	401	410	89	119	1.095	3+	5.81	5.88	5.75
Legend	R	OL	M	323	340	65	119	1.091	4	7.75	6.81	6.75
RusBurbank	LR	L	M(L)	375	405	66	119	1.092	3+	6.38	6.06	5.75
Shepody	W	L	M	361	370	81	119	1.089	3	5.06	5.63	5.75

1.-6. See Maine Breeding Table 1.

7. Chip color from Potato Chip Institute International Chart where 1 = very light and 10 = very dark; less than 5 is acceptable. Data are averages of December and February cooking dates, four replications, five tubers. Potatoes stored at 41F, 45F and 50F.

8. Percent large: percent over 3-1/2" in length.

9. French fry processing results for color, texture, and flavor; 1-4 = poor, not acceptable; 5 = fair; and 6-9 = good.

Michigan Potato Variety Evaluations

D.S. Douches, R.W. Chase, K. Jastrzebski, R. Hammerschmidt, W. Kirk, C. Long, K. Walters, J. Coombs, and J. Greyerbiehl

The objectives of the evaluations are to identify superior varieties for fresh market or for processing and to develop recommendations for the growing of those varieties. The varieties were compared in groups according to the tuber type and skin color and to the advancement in selection. Each season, total and marketable yields, specific gravity, tuber appearance, incidence of external and internal defects, chip color (from field, 42 and 50 F storage), dormancy (at 50 F), as well as susceptibilities to late blight, common scab, *Fusarium* dry rot, *Erwinia* soft rot, and blackspot bruising are determined.

Six field experiments were conducted at the Montcalm Research Farm in Entrican, MI. They were planted in randomized complete block design with four replications. The plots were 23 feet long and spacing between plants was 12 inches. Inter-row spacing was 34 inches. Supplemental irrigation was applied as needed.

The round white tuber types were harvested at two dates (Date-of-Harvest trial). The other field experiments were the Long, North Central Regional, Robinson, and European trials. In each of these trials the yield was graded into four size classes, incidence of external and internal defects in > 3.25 in. diameter or 10 oz. potatoes were recorded, and samples for specific gravity, chipping, dormancy, disease tests, bruising, and cooking tests were taken. Chip quality was assessed on 25-tuber samples, taking two slices from each tuber. Chips were fried at 365 F. The color was measured visually with the SFA 1-5 color chart. Tuber samples were also stored at 42 and 50 F for chip-processing out of storage in January and March.

Round White Varieties

Three varieties and 22 breeding lines were compared at two harvest dates. Atlantic, Snowden, and Onaway were used as checks. The trials were subject to early growth due to the warm spring with subsequent earlier maturity. The plot yields were high in the early harvest (98 days), however,

little yield increase was observed for the second harvest date (133 days). It was also a below average year for specific gravity. The results are presented in Tables 1 and 2. In the early harvest trial NY112, MSE221-1, MSF373-8, MSF099-3, MSE228-1, and E018-1 had the highest yields of the 25 entries. At the later harvest NY112, MSF373-8, MSE018-1, MSE221-1, and MSF099-3 were still the top yielders along with MSE149-5Y and Atlantic. MSE149-5Y and MSE018-1 were also top yielders in the on-farm processing trials, while MSE228-1 was the top yielder in the on-farm tablestock trial. Internal brown spot and hollow heart incidence were low within the trial, however vascular discoloration was more prevalent as in 1997.

Variety characteristics. *MSA091-1* - an MSU selection for chip-processing with scab resistance. Yields in 1998 were below average, but it has performed well in other states, and the late blight trials indicate a reduced susceptibility to late blight. It is a candidate for the 1999 SFA Trials.

MSB076-2 - this MSU selection has high yield potential, has very high specific gravity, and is resistant to scab, but the chip-processing tends to be variable. It is between Atlantic and Snowden in maturity, and we observed, in some instances, a tendency for hollow heart in oversize tubers. It has a large and upright vine type. This selection had the highest overall merit rating in the 1996 and 1997 North Central Regional Trials.

MSB107-1 - an MSU selection for the tablestock market. It is a bright-skinned with large, round tubers with excellent internal quality. This selection performed well in grower trials in 1996-1998.

MSE018-1 - an MSU chip-processing selection with high yield potential. It was an outstanding yielder in the 1997 and 1998 on-farm trials. Specific gravity is high and it has a good general appearance. Scab tolerance is intermediate and it has a reduced susceptibility to late blight. This line was in the 1998 SFA Trials. Chip-processing was variable in the 1998 on-farm trials.

MSE149-5Y - an MSU tablestock/chip-processing selection. It has high yield potential and produces attractive round tubers with a bright skin and light yellow flesh. It was the top yielder in the 1998 on-farm chip-processing trials. It chips out of 45 F cold storage, but has a low specific gravity. It is a candidate for the transformation with the starch gene to raise the specific gravity.

MSE221-1 - an MSU tablestock selection. It has high yield potential as seen in the MSU and on-farm trials. General appearance is good, but it has a netted appearance similar to Superior. It has strong resistance to scab.

MSE228-1 - an MSU tablestock selection. It has high yield potential as seen in the MSU trial. It was the top yielder in

Douches is an associate professor, Chase is a professor emeritus, Jastrzebski is a visiting scholar, Long is a research technician, and Walters and Coombs are graduate assistants in the Department of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824. Hammerschmidt is a professor and Kirk is a visiting assistant professor in the Department of Botany and Plant Pathology, Michigan State University, East Lansing, MI 48824.

the on-farm tablestock trials. We now have tissue culture-derived seed for the 1999 field season.

MSE228-11 - an MSU selection for the tablestock/chip-processing market. It has high yield potential with a high tuber set. It has a mid-season maturity. It will chip-process out of the field and also has a bright skin with an attractive general appearance. In the 1998 on-farm trials it performed well.

MSE246-5 - an MSU chip-processing selection. It produces round tubers, has some scab tolerance along with reduced susceptibility to late blight. It also chip-processes from 45 F cold storage. A candidate for the 1999 grower trials.

MSF373-8 - an MSU tablestock selection. It produces large tuber with excellent internal quality. Tuber set is low and it sizes early. The tubers have medium deep eyes.

MSF099-3 - an MSU chip-processing selection. It has high specific gravity, smooth attractive tubers, excellent chip quality and will chip-process from 45 F cold storage. It is a candidate for the 1999 grower trials.

MSNT-1 - an MSU chip-processing selection. It has above average yield potential, excellent chip quality, and strong resistance to scab. Yield was below average in the 1998 MSU trial. It was in the 1998 SFA trials.

Long Varieties

Six varieties and five breeding lines were tested in 1998. Russet Burbank, Russet Norkotah, and Shepody were grown as check varieties. The trial was dug at 127 days from planting and results are shown in Table 3. Early die was present in the trial resulting in moderate yield and lower specific gravity. Within the 11 entries, MSG088-6Rus, A7961-1, Umatilla Russet (AO82611-7), and Shepody produced the highest yields; however, pickouts were high in MSG088-6Rus and Shepody.

Variety characteristics. *A7961-1* - is an USDA-Aberdeen entry with good performance. It has uniform appearance, heavier russetting than Russet Burbank and minimal internal defects. It can be used for frozen-processing. It will be named in the Northwest.

A8495-1 - is an USDA-Aberdeen entry with average performance in Michigan. It has similar yield as Russet Burbank, but a more desirable size distribution. It will be named in the Northwest.

Innovator - a European selection that has attractive russetting and produces excellent fry color, but has a low specific gravity.

MSB106-7 - a MSU tablestock selection. It has high yield potential as seen in the on-farm trials, but performed poorly at MSU. Tubers are oblong-long with a light netting.

MSE192-8RUS - a MSU tablestock selection. The tubers have an attractive russetting and shape. The yield in on-farm trials have been disappointing. The vine is small which may make this line uncompetitive in small plot trials.

Umatilla Russet (AO82611-7) - this selection was the top performing line in 1997 and performed well in 1998. It is suitable for the frozen processing market. It is reported to have some resistance to early dying. Tuber shape is long but tuber width is narrow.

North Central Regional Trial

The North Central Trial is conducted in a wide range of environments (10 states) to provide adaptability data for the release of new varieties from North Dakota, Minnesota, Wisconsin, Michigan, and Canada. Eighteen breeding lines and seven varieties were tested in Michigan. The results are presented in Table 4. The range of yields was wide and the specific gravity was low. The MSU selection MSA091-1 performed well in 1998. The line with the highest overall merit was the red-skinned selection MN17922, followed by Atlantic. MSE192-8RUS had a nice russetting and good tuber type, but an average yield. W1313, a Wisconsin seedling, had yield, but was one of the most bruise susceptible lines in all the trials. The North Dakota seedling, ND2676-10, has a nice appearance, some scab resistance, and a good chip score, but it had a below average yield and a specific gravity under the industry standards.

European/Yellow and Robinson Trials

Nine European varieties and advanced selections were tested along with eight yellow-fleshed MSU seedlings. Yukon Gold and Saginaw Gold were used as checks. The results are summarized in Table 5. Typically, most of the European selections and varieties are late to very-late in maturity; but in 1998, the vines died early and we observed low specific gravity and a high percentage of 'B' size tubers. The yields varied considerably. The best performing lines in 1998 were A097-1Y, MSE048-2Y, and Caesar. Lady Rosetta, a chip-processing line, had high specific gravity, but IBS in the tubers. Pickouts were high in Latona, Turbo, and Dali. Obelix has nice tuber appearance along with Caesar, but scab susceptibility is high in Obelix. The Robinson trial tested four varieties (Table 6). The trial was subject to early die and below average yields were observed with few oversized tubers. Atlantic was the highest yielding variety in the trial. Navan was the most promising line from Robinson with chip-processing characteristics. Rocket and Saxon are bright-skinned tubers with good general appearance.

Potato Scab Evaluation

Each year a replicated field trial at the MSU Soils Farm is conducted to assess resistance to common and pitted scab. The varieties are ranked on a 1-5 scale based upon a combined score for scab coverage and lesion severity. Usually examining one year's data does not indicate which varieties are resistant but it should begin to identify ones that can be classified as susceptible to scab. Our goal is to evaluate important advanced selections and varieties in the study at least three years to obtain a valid estimate of the level of resistance in each line. We now have had five years of good scab trials (i.e. high levels of infection in susceptible lines). Table 7A categorizes many of the varieties and advanced selections tested in 1998 at the MSU Soils Farm Scab Nursery. This disease trial is a severe test. The varieties and lines are placed into four arbitrary categories based upon scab infection level and lesion severity. A rating of 1.0 indicates zero to a trace amount of infection. A moderate resistance (1.2 – 1.8) correlates with <10% infection. Susceptible lines have greater than 25% infection with pitted lesions. Scores of 4.0 or greater are found on lines with >50% infection and severe pitted lesions. The check varieties Russet Burbank, Superior, Norchip, Atlantic, and Snowden can be used as references. Scab results are also found in the Trial Summaries (Tables 2, 3, 4, and 5). Table 7B summarizes the 1996-8 scab trial results for the varieties and lines that have been tested at least two years in the past four years. These multi-year results give a more stable rating score for the clones tested in these trials.

Blackspot Susceptibility

Increased evaluations of advanced seedlings and new varieties for their susceptibility to blackspot bruising has been implemented in the variety evaluation program. Check samples of 25 tubers were collected (a composite of 4 reps) from each cultivar at the time of grading. A second 25 tuber sample was similarly collected, placed in 50 F storage overnight, and then was placed in a hexagon plywood drum and tumbled 10 times to provide a simulated bruise. Both samples were peeled in an abrasive peeler in October and individual tubers were assessed for the number of blackspot bruises on each potato. Table 8 summarizes the data for the samples receiving the simulated bruise. The bruise data are represented in two ways: percentage of bruise free potatoes and average number of bruises per tuber. A high percentage of bruise-free potatoes is the desired goal; however, the numbers of blackspot bruises per potato is also important. Cultivars which show blackspot incidence greater than Atlantic are approaching the bruise-susceptible rating. In addition, the data is grouped by trial, since the bruise levels can vary between trials. We are also hoping the uniform tuber temperature prior to bruising may help reduce variability observed in previous years. These results become more meaningful when evaluated over 3 years which

reflects different growing seasons and harvest conditions. Bruising was more severe in 1996 and 1998 than in 1997 and 1995.

Late Blight Trial

In 1998 a late blight trial was conducted at the Muck Soils Research Farm. Over 175 entries were evaluated in replicated plots. The field was inoculated mid-July and ratings were taken during July and August. Most lines were highly susceptible to the US-8 genotype of late blight. Lines with the least infection were AWN86514-1, B0692-4, B0718-3, NY121 (Q237-25), and MSG274-3. The good agronomic qualities of MSG274-3 (see Table 1 of Breeding Report) make this selection the strongest candidate for commercialization. Lines with reduced susceptibility to late blight are Umatilla Russet, NorDonna, MSA091-1, Pike, MSH120-1, MSG050-2, and MSE246-5. Foliar susceptibility of all the lines tested against the US-8 genotype of late blight is summarized in Table 9.

Post-harvest Disease Evaluation: Fusarium Dry Rot

As part of the postharvest evaluation, resistance to *Fusarium sambucinum* (fusarium dry rot) was assessed by inoculating 8 whole tubers post-harvest from each line in the variety trials. The tubers were held at 20 C for approximately three weeks and then scored for dry rot infection depth and width. These data are summarized in Table 10. The clones in this table are ranked according to infection depth. Infection levels within a clone can vary as seen by the multiple tests of the check varieties. Snowden, which has tolerance to fusarium, had infections from 4.4-12.3 mm in depth. Russet Burbank infections ranged from 9.7-12.2 mm, while Atlantic infections were from 16.2-26.8 mm. Few clones have low levels of infection. The best lines identified in this experiment were P83-11-5, A091-1, G034-2, G049-4, E263-10, F165-6RY, E080-4, G088-6RUS, H067-3, and E030-4. The results from this study support the tolerance observed for Snowden, A091-1, Superior, E030-4, and GoldRush in 1997.

Michigan Table 1. ROUND WHITES: EARLY HARVEST. Montcalm Research Farm, August 10, 1998 (98 days).

CLONE	CWT/A		PERCENT OF TOTAL ¹					QUALITY ²					TOTAL		CWT/A 3-Year Avg.
	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	SFA ³	HH	VD	IBS	BC	CUT	
NY112	539	570	95	5	83	11	0	1.075	1.0	1	0	0	0	40	-
MSE221-1	462	495	93	5	68	25	2	1.066	-	1	0	0	0	40	297*
MSF373-8	430	453	95	2	43	52	3	1.071	1.0	3	0	0	0	40	-
MSF099-3	407	444	92	8	82	10	1	1.081	1.0	1	0	0	1	40	-
MSE228-1	383	442	87	10	73	13	3	1.064	-	2	1	0	0	40	-
MSE018-1	370	412	90	10	81	9	0	1.074	1.0	2	0	0	0	40	226
ATLANTIC	350	395	89	9	81	8	2	1.081	1.0	6	0	0	0	40	259
MSE149-5Y	337	401	84	15	77	7	1	1.065	1.0	0	0	0	0	40	-
MSB107-1	330	355	93	5	67	26	2	1.068	-	0	0	0	0	40	205
NY115	328	382	86	14	82	3	0	1.068	1.0	0	1	0	0	40	-
MSA091-1	312	373	84	8	75	8	8	1.078	1.0	1	0	0	2	40	195
MSB073-2	309	401	77	22	77	0	1	1.079	1.0	0	0	0	0	40	170*
MSB076-2	308	353	87	11	82	5	2	1.083	1.5	7	0	0	0	40	201
SNOWDEN	298	355	84	14	77	7	2	1.077	1.0	2	0	0	0	40	190
ONAWAY	296	349	85	11	81	4	4	1.063	-	1	4	1	0	40	247
MSF015-1	289	356	81	18	79	2	0	1.066	1.0	0	0	0	0	40	-
MSNT-1	278	365	76	23	74	2	1	1.079	1.0	0	0	0	0	40	198*
MSE246-5	264	322	82	17	79	3	1	1.088	1.0	8	0	0	0	40	-
MSE263-10	258	315	82	17	80	2	1	1.071	1.0	0	0	0	0	40	-
MSE230-6	258	468	55	41	55	0	4	1.082	1.0	0	0	0	0	40	-
MSC148-A	237	331	72	24	69	2	4	1.071	1.0	1	1	0	0	40	156*
MSE228-9	234	317	74	24	72	1	2	1.076	1.0	0	0	0	0	40	192*
MSC103-2	203	231	88	7	71	16	6	1.063	-	1	0	0	0	40	148*
MSE250-2	196	313	63	37	63	0	1	1.083	1.0	0	0	0	0	40	-
MSE228-11	173	344	50	50	50	0	0	1.079	1.0	0	2	0	0	40	156*
MEAN	314	382						1.074							
LSD _{0.05}	60	60						0.003							

¹SIZE

B - < 2"

A - 2-3.25"

OV - > 3.25"

PO - PICKOUTS

²Quality

HH - Hollow Heart

BC - Brown Center

VD - Vascular Discoloration

IBS - Internal Brown Spot

³Snack Food Association Chip Score

Out of the Field Ratings: 1-5

1: Excellent

2: Poor

*2-year average

PLANTED MAY 4, 1998

Michigan Table 2. ROUND WHITES: LATE HARVEST: September 14, 1998 (133 days).

CLONE	CWT/A		Percent by Weight ¹				QUALITY ²					Total		Maturity ⁵	CWT/A 3-Year Avg.		
	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	SFA ³	HH	VD	IBS	BC			Cut	
NY112	512	556	92	8	84	8	0	1.072	1.0	0	0	0	0	40	1.8	3	-
F373-8	463	482	96	2	37	59	2	1.073	1.0	4	1	0	0	40	2.3	5	412
E018-1	456	501	91	8	73	18	1	1.075	1.0	3	1	0	0	40	3.0	5	423
E221-1	417	455	92	6	71	20	2	1.062	1.0	0	4	0	0	40	1.5	1	328
ATLANTIC	402	443	91	8	77	13	1	1.081	1.0	5	1	0	0	40	3.3	2	339
F099-3	384	429	90	10	82	7	0	1.079	1.0	0	1	0	0	40	3.7	2	284
E149-5Y	368	408	90	10	78	12	0	1.063	1.0	0	1	0	0	40	1.8	2	303
E228-1	358	431	83	11	66	17	5	1.063	1.5	0	1	0	0	40	2.8	3	352
NY115	358	428	84	16	77	7	0	1.067	1.0	0	1	1	0	40	4.0	1	-
B107-1	345	378	91	6	61	31	2	1.068	1.0	2	1	0	0	40	1.0	4	340
SNOWDEN	335	391	86	14	80	6	1	1.075	1.0	2	0	0	0	40	3.5	3	278
B073-2	322	415	78	22	77	0	0	1.077	1.0	0	1	0	1	40	1.7	3	268
E246-5	307	376	82	17	78	3	1	1.087	1.0	4	1	0	0	40	1.0	4	229*
B076-2	296	365	81	16	78	3	3	1.079	1.0	3	1	0	0	40	1.2	2	259
E263-10	291	350	83	16	83	0	0	1.070	1.0	0	0	0	0	40	3.0	1	256*
A091-1	287	347	83	9	64	18	8	1.075	1.0	0	4	0	2	40	1.5	3	261
E228-9	277	369	75	24	74	1	1	1.073	1.0	0	3	0	0	40	3.0	1	247
ONAWAY	270	338	80	18	79	1	2	1.060	3.0	0	4	0	0	40	1.5	1	267
F015-1	262	352	74	25	72	2	0	1.063	1.0	0	1	1	0	40	1.0	1	266*
C103-2	260	284	92	6	63	28	2	1.067	2.0	1	1	0	0	40	3.7	5	262
NT-1	234	346	68	31	66	2	1	1.077	1.0	3	0	1	0	40	1.8	3	246
E250-2	228	325	70	28	69	1	2	1.081	1.0	0	0	0	0	40	4.0	4	202*
E230-6	224	437	51	45	51	0	3	1.079	1.0	0	0	0	0	40	2.3	2	250
E228-11	204	410	50	49	50	0	1	1.075	1.0	0	2	0	0	40	3.2	2	253
C148-A	183	290	63	35	62	1	1	1.070	1.0	0	2	0	0	40	3.3	1	158
MEAN	322	396						1.072									
LSD _{0.05}	60	60						0.003									

³Snack Food Association Chip Score

Out of the Field Ratings: 1 - 5

1: Excellent

5: Poor

* 2-year Average

²QUALITY

HH - Hollow Heart

BC - Brown Center

VD - Vascular Discoloration

IBS - Internal Brown Spot

⁵Maturity

1 = Vine Dead by August 13

5 = 100% Green on August 13

⁴Scab

1 = Very Resistant

5 = Very Susceptible

Michigan Table 3. LONG WHITES/RUSSETS. September 10, 1998 (129 days).

CLONE	CWT/A		Percent by Weight ¹					QUALITY ²					Total		CWT/A	
	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	FF ³	HH	VD	IBS	BC	Cut	Scab ⁴	3-Year Avg.
G088-GRUS	410	570	72	9	57	15	19	1.079	1.5	3	1	0	0	40	1.8	-
A7961-1	381	476	80	18	65	15	2	1.075	1.5	4	5	0	1	40	1.0	261
UMATILLA R	332	490	68	27	62	6	6	1.075	1.0	1	3	0	0	40	1.0	273
SHEPODY	324	421	77	12	59	18	11	1.074	1.5	2	15	0	0	40	3.3	273
A8495-1	296	352	84	14	70	14	2	1.075	1.0	8	1	0	0	40	1.0	207*
R BURBANK	293	448	65	29	58	8	6	1.072	2.0	1	1	0	0	40	1.0	230
INNOVATOR	291	397	73	21	64	9	5	1.067	1.0	0	4	0	0	40	3.8	-
E192-8RUS	225	304	74	23	63	11	3	1.067	1.0	0	3	0	0	40	1.0	195
GOLDRUSH	223	299	75	24	60	15	1	1.064	2.0	0	5	0	0	40	1.0	254*
B106-7	212	327	65	30	61	3	6	1.060	2.0	0	7	0	0	40	2.3	250
R NORKOTAH	207	311	67	32	65	2	1	1.065	1.5	2	3	0	0	40	2.0	161
MEAN	290	400						1.070								
LSD _{0.05}	83	88						0.011								

¹SIZE

B - < 4 oz.

A - 4-10 oz.

OV - > 10 oz.

PO - PICKOUTS

²QUALITY

HH - Hollow Heart

BC - Brown Center

VD - Vascular Discoloration

IBS - Internal Brown Spot

³French Fry Color Score

1: Light

5: Dark

⁴SCAB

1 = Very Resistant

5 = Very Susceptible

* 2-year Average

Michigan Table 4. NORTH CENTRAL TRIAL. September 8, 1998 (127 days).

CLONE	CWT/A		Percent by Weight ¹				QUALITY ²							Total	
	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	SFA ³	HH	VD	IBS	BC	Cut	Scab ⁴
R PONTIAC	475	518	92	6	70	21	2	1.055	3.0	5	2	0	0	40	3.3
ND5084-3R	471	513	92	7	75	17	1	1.053	3.0	0	3	1	0	40	2.5
MN16966	383	487	79	19	76	2	2	1.072	1.0	0	9	0	0	40	3.0
MN17922	372	387	96	3	65	31	0	1.056	2.0	1	7	0	0	40	1.7
A091-1	363	397	91	8	73	18	0	1.078	1.5	2	5	1	0	40	1.5
W1313	355	403	88	12	86	2	0	1.087	1.0	5	2	4	0	40	2.7
ATLANTIC	344	378	91	9	72	19	0	1.078	1.0	9	1	1	0	40	3.3
B073-2	317	377	84	15	79	5	1	1.075	2.0	0	4	0	0	40	1.7
W1355-1	315	435	73	27	72	1	0	1.080	1.0	0	1	0	0	40	3.0
SNOWDEN	313	366	86	14	80	6	0	1.076	1.0	2	8	0	0	40	3.5
NORCHIP	291	358	81	17	79	2	2	1.070	2.0	0	3	0	0	40	2.0
MN17572	287	389	74	26	71	3	0	1.052	2.0	0	2	1	0	40	1.0
W1151RUS	287	364	79	21	72	6	0	1.057	1.5	2	6	0	0	40	1.0
NORLAND	286	329	87	12	81	6	1	1.052	3.0	1	1	0	1	40	1.0
E230-6	276	376	73	24	73	0	2	1.078	1.5	1	1	0	0	40	2.3
ND2676-10	275	364	75	24	75	1	0	1.071	1.0	0	10	0	0	40	1.5
WIS75-30	274	385	71	28	70	1	0	1.074	1.5	1	2	0	0	40	2.0
E192-8RUS	251	332	75	22	54	21	2	1.066	-	1	4	0	0	40	1.0
FV8957-10	243	285	85	14	74	11	0	1.063	1.5	4	0	0	0	40	-
R BURBANK	229	352	65	19	60	5	16	1.069	1.5	3	7	0	0	40	1.0
ND2470-27	215	238	90	10	74	16	0	1.065	1.0	1	5	0	0	40	2.3
MN16478	159	198	80	19	79	1	1	1.075	2.0	0	7	0	0	40	2.3
W1348RUS	146	292	50	50	49	1	0	1.070	1.5	1	0	0	0	40	1.0
ND4093-4RUS	129	251	52	48	51	0	0	1.063	2.0	0	0	0	0	40	1.0
R NORKOTAH	127	215	59	41	53	6	0	1.060	2.5	1	5	0	0	40	2.0
MEAN	287	360						1.068							
LSD _{0.05}	80	80						0.003							

¹SIZE

B - < 2"

A - 2-3.25"

OV - > 3.25"

PO - Pickouts

²QUALITY

HH - Hollow Heart

BC - Brown Center

VD - Vascular Discoloration

IBS - Internal Brown Spot

³Snack Food Association Chip Score

Out of the Field Ratings: 1-5

1: Excellent

5: Poor

⁴SCAB

1 = Very Resistant

5 = Very Susceptible

Michigan Table 5. EURO/YELLOW TRIAL, September 30, 1998 (149 days).

Clone	CWT/A		Percent by Weight ¹						QUALITY ²				Total		CWT/A	
	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	SFA ³	HH	VD	IBS	BC	Cut	Scab ⁴	3-Year Avg.
A097-1Y	479	568	84	13	68	16	3	1.074	-	1	6	0	0	40	2.0	340
E048-2Y	478	530	90	9	73	17	1	1.073	-	8	0	0	0	40	1.0	390
CAESAR	468	531	88	10	84	4	1	1.068	1.5	0	2	3	0	40	1.3	-
F349-1YROSE	440	512	86	12	80	6	2	1.078	1.5	0	2	0	0	40	3.7	452*
OBELIX	366	516	71	26	71	0	3	1.056	2.5	0	1	0	0	40	4.8	267*
E222-5Y	334	419	80	17	77	3	3	1.072	2.0	9	3	0	0	40	2.0	281*
ACCENT	325	461	70	27	70	0	3	1.060	3.0	0	10	0	0	40	2.0	-
E226-4Y	311	359	86	12	77	9	1	1.059	2.0	1	0	0	0	40	2.3	298
MS401-1	286	362	79	19	77	2	2	1.075	1.0	2	0	0	0	40	3.0	-
YUKON GOLD	280	317	88	10	80	8	2	1.071	2.0	0	1	1	0	40	2.7	251
LATONA	275	471	58	34	58	0	8	1.075	2.0	0	10	3	0	40	3.8	328
FAMBO	273	377	72	25	68	4	3	1.064	1.5	0	8	1	0	40	3.0	-
SAG GOLD	260	365	71	28	70	1	1	1.068	1.0	0	1	0	0	40	2.0	246
LADY ROSETTA	252	407	62	33	61	1	5	1.085	1.0	11	1	6	0	40	2.5	-
F165-6RY	240	319	75	18	66	9	7	1.062	2.5	6	6	0	0	40	4.0	237
TURBO	216	457	47	31	47	0	21	1.063	2.0	0	12	2	0	40	2.5	-
C120-1Y	187	268	70	27	70	0	3	1.061	1.5	0	0	0	0	40	1.0	172
MIRAKEL	187	382	49	49	49	0	2	1.070	2.5	0	1	14	0	40	3.0	-
DALI	124	343	36	52	36	0	11	1.059	2.5	0	4	0	0	40	3.0	100*
MEAN	304	419						1.068								
LSD _{0.05}	79	81						0.0055								

¹ SIZE	² QUALITY	³ Snack Food Association Chip Score	⁴ SCAB
B - < 2"	HH - Hollow Heart	Out of the Field Ratings: 1-5	1 = Very Resistant
A - 2-3.25"	BC - Brown Center	1: Excellent	5 = Very Susceptible
OV - > 3.25"	VD - Vascular Discoloration	5: Poor	
PO - Pickouts	IBS - Internal Brown Spot		* 2-year Average

Michigan Table 6. ROBINSON STUDY. September 29, 1998 (145 days).

CLONE	CWT/A		Percent by Weight ¹				QUALITY ²							Total	
	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	SFA ³	HH	VD	IBS	BC	Cut	
ATLANTIC	300	348	86	13	81	5	1	1.082	1.0	3	4	0	1	40	
NAVAN	242	354	68	31	67	2	0	1.079	1.5	0	2	0	0	40	
SNOWDEN	210	301	70	30	67	2	0	1.077	1.0	0	15	0	0	40	
ROCKET	204	370	55	42	55	0	3	1.072	-	0	11	0	0	40	
MARIS BARD	180	273	66	31	66	0	3	1.066	2.0	2	5	0	0	40	
YUKON GOLD	172	202	85	14	76	9	1	1.071	2.0	0	8	0	0	40	
SAXON	151	301	50	49	50	0	0	1.061	-	0	4	0	0	40	
SUPERIOR	128	226	56	43	56	0	1	1.065	-	0	6	1	5	40	
MEAN	198	297						1.072							
LSD _{0.05}	56	63						0.0038							

¹SIZE
 B - < 2"
 A - 2-3.25"
 OV - > 3.25"
 PO - Pickouts

²QUALITY
 HH - Hollow Heart
 BC - Brown Center
 VD - Vascular Discoloration
 IBS - Internal Brown Spot

³Snack Food Association Chip Score
 Out of the Field Ratings: 1-5
 1: Excellent
 5: Poor

Michigan Table 7A. 1998 SCAB RESULTS.

<u>Strong Resistance</u>		<u>Moderate Resistance</u>		<u>Intermediate Infection</u>		<u>Susceptible</u>	
A7961-1	1.0	MSB076-2	1.2	ACCENT	2.0	DALI	3.0
A8495-1	1.0	MSF090-9	1.2	AF1475-20	2.0	FAMBO	3.0
AF1552-5	1.0	MSG119-1RD	1.2	MSA097-1Y	2.0	MIRAKEL	3.0
AO82611-7	1.0	PICASSO	1.2	MSB094-1	2.0	MN16966	3.0
GOLDRUSH	1.0	SUPERIOR	1.2	MSE222-5Y	2.0	MS401-1	3.0
MN17572	1.0	CAESAR	1.3	MSH031-5	2.0	MSE018-1	3.0
MSB107-1	1.0	MSE033-1RD	1.3	MSH311-4	2.0	MSE226-5	3.0
MSC120-1Y	1.0	MSE245-B	1.3	NORCHIP	2.0	MSE263-10	3.0
MSE048-2Y	1.0	MSH098-2	1.3	P83-11-5	2.0	MSF369-1RY	3.0
MSE192-8RUS	1.0	MSA091-1	1.5	R NORKOTAH	2.0	MSG130-1	3.0
MSE246-5	1.0	MSC122-1	1.5	SAG GOLD	2.0	MSG141-3	3.0
MSF015-1	1.0	MSE026-A	1.5	WIS75-30	2.0	MSG145-1Y	3.0
MSF420-1	1.0	MSE221-1	1.5	MN16478	2.3	MSG147-3P	3.0
MSG004-3	1.0	MSE274-A	1.5	MSB106-7	2.3	MSG297-4	3.0
MSG015-C	1.0	MSF060-6	1.5	MSE080-4	2.3	MSH351-6	3.0
MSG034-2	1.0	MSH130-2	1.5	MSE226-4Y	2.3	MSH369-2	3.0
MSG227-2	1.0	ND2676-10	1.5	MSE230-6	2.3	MSH392-1ROSE	3.0
MSH106-2	1.0	ONAWAY	1.5	MSF373-8	2.3	NY121	3.0
MSH361-1	1.0	MN17922	1.7	ND2470-27	2.3	W1355-1	3.0
ND4093-4RUS	1.0	MSB040-3	1.7	ERNTESTOLZ	2.5	MSE228-11	3.2
NY119	1.0	MSB073-2	1.7	LADY ROSETTA	2.5	AF1808-18	3.3
PIKE	1.0	MSG124-8P	1.7	MATILDA	2.5	ATLANTIC	3.3
R NORLAND	1.0	MSH139-4	1.7	MSE040-6RY	2.5	MSC148-A	3.3
R BURBANK	1.0	LILY	1.8	MSF105-10	2.5	MSF019-11	3.3
W1151RUS	1.0	MSE028-1	1.8	MSG265-1	2.5	MSF059-1	3.3
W1348RUS	1.0	MSE149-5Y	1.8	MSH110-2	2.5	MSG274-3	3.3
		MSF020-23	1.8	ND5084-3R	2.5	MSH061-1	3.3
		MSG088-6RUS	1.8	TURBO	2.5	RED PONTIAC	3.3
		MSG261-3	1.8	MSE030-4	2.7	SHEPODY	3.3
		MSH095-4	1.8	MSF313-3	2.7	MSH101-2Y	3.5
		MSNT-1	1.8	MSH067-3	2.7	SNOWDEN	3.5
		NY112	1.8	MSH120-1	2.7	AF1763-2	3.7
		P84-9-8	1.8	W1313	2.7	MSF099-3	3.7
				YUKON GOLD	2.7	MSH127-4	3.7
				MSE228-1	2.8	INNOVATOR	3.8
				MSF165-6RY	2.8	LATONA	3.8
				MSG007-1	2.8	MSE011-14	4.0
						MSE250-2	4.0
						MSF001-2	4.0
						MSG050-2	4.0
						MSH034-1	4.0
						MSH136-2	4.0
						MSNT-2	4.0
						NY115	4.0
						OBELIX	4.8

SCAB RATING:

1 = practically no infection

2 = low infection

3 = avg. susceptibility (e.g. Atlantic)

4 = high susceptibility

5 = severe susceptibility

Michigan Table 7B. 1996-98 MICHIGAN SCAB TRIAL.

<u>Line</u>	<u>1996</u> <u>Rating</u>	<u>1997</u> <u>Rating</u>	<u>1998</u> <u>Rating</u>	<u>Avg.</u>	<u>Line</u>	<u>1996</u> <u>Rating</u>	<u>1997</u> <u>Rating</u>	<u>1998</u> <u>Rating</u>	<u>Avg.</u>
A082611-7	1.0	1.0	1.0	1.0	MSE228-9	1.5	1.8	3.0	2.1
A7961-1	1.0	1.0	1.0	1.0	MSE228-11	3.0	1.5	3.2	2.6
A84118-3	1.0	1.0	---	1.0	MSE230-6	1.5	1.5	2.3	1.8
A8495-1	---	1.0	1.0	1.0	MSE245-B	---	1.5	1.3	1.4
AF1433-4	3.0	1.8	---	2.4	MSE246-5	---	1.4	1.0	1.2
ATLANTIC	3.5	3.3	3.3	3.4	MSE250-2	---	3.2	4.0	3.6
ATX85404-8	3.0	1.6	---	2.3	MSE263-10	---	1.3	3.0	2.2
BC0894-2	2.0	1.3	---	1.7	MSF001-2	---	2.0	4.0	3.0
CENTURYRUS	3.5	3.1	---	3.3	MSF019-11	---	2.8	3.3	3.1
FL1833	1.5	1.7	---	1.6	MSF099-3	---	2.5	3.7	3.1
FL1867	2.0	1.3	---	1.7	MSF165-6RY	---	3.5	2.8	3.2
GOLDRUSH	1.0	---	1.0	1.0	MSF313-3	---	1.8	2.7	2.3
JS111-28	1.0	1.0	---	1.0	MSF373-8	---	3.0	2.3	2.7
MATILDA	2.0	2.3	2.5	2.3	MSG050-2	---	2.0	4.0	3.0
MICHIGOLD	4.0	2.8	---	3.4	MSG077-7Y	---	2.5	3.5	3.0
MN16180	3.0	2.3	---	2.6	MSG104-6	---	3.3	3.5	3.4
MN16489	2.0	1.9	---	2.0	MSG119-1RD	---	2.0	1.2	1.6
MSA091-1	1.0	1.8	1.5	1.4	MSG124-8P	---	1.5	1.7	1.6
MSA097-1Y	2.0	1.7	2.0	1.9	MSG227-2	---	1.0	1.0	1.0
MSB040-3	1.0	1.8	1.7	1.5	MSG261-3	---	3.0	1.8	2.4
MSB073-2	1.5	1.8	1.7	1.7	MSNT-1	1.0	1.0	1.8	1.3
MSB076-2	1.5	1.8	1.2	1.5	ND2225-1R	2.0	3.3	---	2.7
MSB094-1	3.0	3.0	2.0	2.7	ND2676-10	1.5	1.5	1.5	1.5
MSB106-7	3.0	1.3	2.3	2.2	ND860-2	3.0	3.0	---	3.0
MSB107-1	2.5	1.8	1.0	1.8	NORCHIP	3.0	1.8	2.0	2.3
MSC103-2	2.0	---	3.7	2.9	NY101	1.0	1.0	---	1.0
MSC120-1Y	2.5	1.5	1.0	1.7	NY103	3.0	2.5	---	2.8
MSC122-1	1.5	---	1.5	1.5	ONAWAY	1.5	1.0	1.5	1.3
MSC148-A	2.5	2.4	3.3	2.7	PICASSO	1.5	---	1.2	1.4
MSE018-1	3.0	2.6	3.0	2.9	PIKE	1.5	1.7	1.0	1.4
MSE033-1RD	---	1.0	1.3	1.2	R. BURBANK	1.0	1.0	1.0	1.0
MSE048-2Y	2.0	2.1	1.0	1.7	R. NORKOTAH	---	1.8	2.0	1.9
MSE080-4	---	1.8	2.3	2.1	RED NORLAND	2.0	1.0	1.0	1.3
MSE149-5Y	2.0	2.0	1.8	1.9	RED PONTIAC	4.0	2.6	3.3	3.3
MSE192-8	---	1.3	1.0	1.2	SAGINAW GOLD	2.5	1.5	2.0	2.0
MSE202-3	2.0	1.0	---	1.5	SHEPODY	4.0	3.8	3.3	3.7
MSE221-1	1.0	1.0	1.5	1.2	SNOWDEN	3.0	2.5	3.5	3.0
MSE222-5Y	---	3.0	2.0	2.5	W1151	1.5	1.3	1.0	1.3
MSE226-4Y	1.5	1.9	2.3	1.9	W1313	2.5	3.0	2.7	2.7
MSE228-1	---	2.7	2.8	2.8	YUKON GOLD	2.0	3.0	2.7	2.6

SCAB RATING:

1 = practically no infection

2 = low infection

3 = avg. susceptibility (e.g. Atlantic)

4 = high susceptibility

5 = severe susceptibility

Michigan Table 8. 1998 BLACKSPOT BRUISE SUSCEPTIBILITY TEST, Simulated Bruise Samples*.

VARIETY	NUMBER OF SPOT PER TUBER						PERCENT (%)		
	0	1	2	3	4	5+	TOTAL TUBERS	BRUISE FREE	AVERAGE SPOTS/TUBER
DATE OF HARVEST: LONG									
RUSSET NORKOTAH	21	5	2	0	0	0	28	75	0.32
RUSSET BURBANK	20	8	2	0	0	0	30	67	0.40
MSE192-8RUS	11	15	2	0	0	0	28	39	0.68
GOLDRUSH	12	9	7	0	0	0	28	43	0.82
A7961-1	13	6	6	2	1	0	28	46	1.00
A8495-1	10	9	7	1	1	0	28	36	1.07
SHEPODY	6	8	13	2	0	0	29	21	1.38
MSB106-7	5	7	11	3	2	1	29	17	1.76
INNOVATOR	4	6	7	9	1	1	28	14	2.00
UMATILLA	0	2	13	11	5	1	32	0	2.69
MSG088-6RUS	2	1	4	8	5	4	24	8	3.04
DATE OF HARVEST: ROUND WHITES-LATE									
MSE228-1	27	1	0	0	0	0	28	96	0.04
MSE228-9	26	2	0	0	0	0	28	93	0.07
NY115	24	5	0	0	0	0	29	83	0.17
MSB073-2	22	6	0	0	0	0	28	79	0.21
MSE149-5Y	23	4	1	0	0	0	28	82	0.21
ONAWAY	23	3	2	0	0	0	28	82	0.25
MSF015-1	18	8	2	0	0	0	28	64	0.43
MSC148-A	19	5	2	1	0	0	27	70	0.44
SNOWDEN	19	6	2	1	0	0	28	68	0.46
ATLANTIC	16	9	2	1	0	0	28	57	0.57
MSE221-1	15	10	3	0	0	0	28	54	0.57
MSE228-11	14	11	3	0	0	0	28	50	0.61
MSF099-3	17	7	4	1	0	0	29	59	0.62
MSC103-2	15	11	1	2	0	0	29	52	0.66
MSF373-8	16	6	2	3	0	0	27	59	0.70
MSA091-1	14	9	4	1	0	0	28	50	0.71
NY112	16	6	3	3	0	0	28	57	0.75
MSB107-1	9	16	3	0	0	0	28	32	0.79
MSE230-6	12	9	5	1	0	0	27	44	0.81
MSB076-2	12	8	7	1	0	0	28	43	0.89
MSE018-1	13	9	4	0	2	0	28	46	0.89
MSE263-10	11	8	5	1	1	0	26	42	0.96
MSNT-1	9	10	6	0	0	1	26	35	1.04
MSE250-2	10	6	9	2	1	0	28	36	1.21
MSE246-5	3	9	9	3	2	1	27	11	1.81

*Tuber samples were collected at harvest, graded, and placed in a six-sided plywood drum and rotated ten times to produce simulated bruising. Samples were abrasive-peeled and scored on October 20, 1998. Table is presented in descending order of average number of spots per tuber.

Michigan Table 8. Continued.

VARIETY	NUMBER OF SPOT PER TUBER						PERCENT (%)		
	0	1	2	3	4	5+	TOTAL TUBERS	BRUISE FREE	AVERAGE SPOTS/TUBER
<u>NORTH CENTRAL REGIONAL TRIAL</u>									
NORLAND	26	2	0	0	0	0	28	93	0.07
FV8957-10	23	5	0	0	0	0	28	82	0.18
MN17572	23	4	1	0	0	0	28	82	0.21
ND2676-10	22	6	0	0	0	0	28	79	0.21
RUSSET NORKOTAH	23	5	1	0	0	0	29	79	0.24
MSE192-8RUS	22	4	2	0	0	0	28	79	0.29
W1151RUS	21	5	2	0	0	0	28	75	0.32
MN17922	22	4	3	0	0	0	29	76	0.34
MSE230-6	20	7	2	0	0	0	29	69	0.38
RUSSET BURBANK	19	6	2	1	0	0	28	68	0.46
MSB073-2	16	6	4	0	0	0	26	62	0.54
RED PONTIAC	16	9	2	1	0	0	28	57	0.57
ND5084-3R	17	4	4	1	1	0	27	63	0.70
ND2470-27	10	17	2	0	0	0	29	34	0.72
NORCHIP	15	15	1	0	1	1	33	45	0.79
SNOWDEN	8	14	4	1	0	0	27	30	0.93
MSA091-1	10	10	5	2	0	0	27	37	0.96
ND4093-4RUS	10	9	7	1	0	0	27	37	0.96
W75-30	12	9	4	2	1	0	28	43	0.96
MN16478	9	9	7	2	0	0	27	33	1.07
ATLANTIC	13	7	1	3	1	2	27	48	1.19
MN16966	7	11	5	4	0	2	29	24	1.48
W1348RUS	7	9	6	2	1	3	28	25	1.64
W1355-1	1	7	9	6	2	1	26	4	2.15
W1313	1	2	11	7	6	1	28	4	2.64
<u>YELLOW FLESH & EUROPEAN TRIAL</u>									
DALI	27	1	0	0	0	0	28	96	0.04
TURBO	27	1	0	0	0	0	28	96	0.04
MSF165-6RY	25	3	1	0	0	0	29	86	0.17
MS401-1	23	6	0	0	0	0	29	79	0.21
FAMBO	19	4	0	1	0	0	24	79	0.29
ACCENT	20	4	2	0	1	0	27	74	0.44
YUKON GOLD	16	9	0	1	0	0	26	62	0.46
OBELIX	14	8	2	0	0	0	24	58	0.50
SAGINAW GOLD	14	7	3	1	0	0	25	56	0.64
LATONA	17	7	3	1	1	0	29	59	0.69
MSE226-4Y	12	10	6	1	0	0	29	41	0.86
MATILDA	13	7	1	3	0	1	25	52	0.92
MSA097-1Y	10	12	3	3	0	0	28	36	0.96
LILY	11	8	4	4	0	0	27	41	1.04
PICASSO	9	6	4	2	1	0	22	41	1.09
MSE048-2Y	8	8	8	1	1	2	28	29	1.46
MSC120-1Y	7	6	9	4	4	0	30	23	1.73
MIRAKEL	5	5		10	2	0	22	23	1.95
MSF349-1YROSE	5	6	6	2	5	1	25	20	1.96
CAESAR	3	5	10	2	4	1	25	12	2.08
LADY ROSETTA	4	7	7	3	5	2	28	14	2.14
MSE222-5Y	1	1	3	8	10	5	28	4	3.43

Michigan Table 8. Continued.

VARIETY	NUMBER OF SPOT PER TUBER						PERCENT (%)		
	0	1	2	3	4	5+	TOTAL TUBERS	BRUISE FREE	AVERAGE SPOTS/TUBER
<u>MSU BREEDING LINES 2 X 23 TRIAL</u>									
MSH098-2	19	1	0	0	0	0	20	95	0.05
MSG147-3P	18	2	0	0	0	0	20	90	0.10
MSH120-1	19	1	1	0	0	0	21	90	0.14
MSF369-1RY	16	4	0	0	0	0	20	80	0.20
MSH018-3	15	5	0	0	0	0	20	75	0.25
MSG004-3	14	6	0	0	0	0	20	70	0.30
ONAWAY	12	6	0	0	0	0	18	67	0.33
MSE028-1	13	5	1	0	0	0	19	68	0.37
MSE040-6RY	12	7	0	0	0	0	19	63	0.37
MSG145-1	14	5	0	1	0	0	20	70	0.40
MSH031-5	12	8	0	0	0	0	20	60	0.40
MSH130-2	12	8	0	0	0	0	20	60	0.40
MSG034-2	14	3	1	1	0	0	19	74	0.42
MSH101-2Y	13	4	2	0	0	0	19	68	0.42
MSE026-A	13	6	0	1	0	0	20	65	0.45
MSG130-1	13	5	2	0	0	0	20	65	0.45
MSE084-5	14	3	2	1	0	0	20	70	0.50
MSG141-3	10	8	1	0	0	0	19	53	0.53
MSH067-3	13	3	3	1	0	0	20	65	0.60
MSF090-9	10	7	3	0	0	0	20	50	0.65
MSG301-9	10	7	2	1	0	0	20	50	0.70
MSH321-1	10	6	4	0	0	0	20	50	0.70
MSH361-1	11	6	1	2	0	0	20	55	0.70
MSH136-2	10	6	3	1	0	0	20	50	0.75
MSH308-2	10	6	3	0	1	0	20	50	0.80
MSH061-1	6	10	5	0	0	0	21	29	0.95
MSF001-2	8	6	4	2	0	0	20	40	1.00
MSG017-4	6	9	4	1	0	0	20	30	1.00
MSH142-2	4	12	4	0	0	0	20	20	1.00
MSE074-1	6	5	6	2	0	0	19	32	1.21
MSF420-1	4	11	3	3	0	0	21	19	1.24
MSG257-7	7	8	0	3	2	0	20	35	1.25
MSE74-A	5	6	7	1	1	0	20	25	1.35
MSH311-4	3	8	8	1	0	0	20	15	1.35
MSH351-6	7	5	4	2	2	0	20	35	1.35
MSG261-3	5	8	5	4	0	0	22	23	1.36
AF1552-5	4	8	4	4	0	0	20	20	1.40
AF1808-18	2	9	1	4	0	0	16	13	1.44
MSH369-2	3	6	9	2	0	0	20	15	1.50
MSH106-2	0	9	9	2	0	0	20	0	1.65
MSH086-3	3	7	4	3	2	0	19	16	1.68
MSG050-2	1	9	6	2	2	0	20	5	1.75
MSG139-1	5	3	6	4	0	2	20	25	1.85
MS392-1	2	7	6	4	2	0	21	10	1.86
SNOWDEN	2	5	4	5	2	0	18	11	2.00
MSG297-4	1	5	5	6	2	0	19	5	2.16
MSH095-4	3	4	6	1	2	4	20	15	2.35
MSH419-1	2	2	8	3	2	3	20	10	2.50

Michigan Table 8. Continued.

VARIETY	NUMBER OF SPOT PER TUBER						PERCENT (%)		
	0	1	2	3	4	5+	TOTAL TUBERS	BUISE FREE	AVERAGE SPOTS/TUBER
MSG015-C	0	3	6	7	4	0	20	0	2.60
ATLANTIC	2	2	2	6	3	3	18	11	2.83
MSF060-6	1	2	3	4	5	4	19	5	3.16
ADAPTATION TRIAL									
NY121	27	1	0	0	0	0	28	96	0.04
SUPERIOR	26	2	0	0	0	0	28	93	0.07
MSE033-1RD	24	3	0	0	0	0	27	89	0.11
MSG119-1RD	22	4	0	0	0	0	26	85	0.15
AF1763-2	20	6	0	0	0	0	26	77	0.23
MSB040-3	16	11	1	0	0	0	28	57	0.46
MSE030-4	16	7	3	0	0	0	26	62	0.50
NY119	17	8	4	0	0	0	29	59	0.55
MSF014-9	15	7	4	0	0	0	26	58	0.58
MSG227-2	18	3	6	1	0	0	28	64	0.64
MSB094-1	14	9	1	3	0	0	27	52	0.74
MSF313-3	18	5	5	0	2	0	30	60	0.77
P83-11-5	13	8	4	2	0	0	27	48	0.81
AF1475-20	10	13	2	1	1	0	27	37	0.89
MSG007-2	10	11	5	1	0	0	27	37	0.89
ERNTESTOLZ	10	7	6	1	0	0	24	42	0.92
MSE245-B	10	10	8	0	0	0	28	36	0.93
MSF020-23	10	13	5	1	2	0	31	32	1.10
P84-9-8	8	12	7	0	0	1	28	29	1.11
MSF059-1	13	7	3	0	2	2	27	48	1.15
ONAWAY	11	8	5	5	2	0	31	35	1.32
MSE011-14	9	8	6	5	1	0	29	31	1.34
MSE080-4	11	3	6	2	3	1	26	42	1.46
SNOWDEN	7	8	5	5	2	0	27	26	1.52
ATLANTIC	8	8	4	3	4	1	28	29	1.64
MSG104-6	9	3	5	5	3	2	27	33	1.85
MSF019-11	3	7	6	6	4	0	26	12	2.04
AF1753-16	4	4	5	4	4	2	23	17	2.26
MSF105-10	4	6	8	3	5	3	29	14	2.28
MSG274-3	2	4	7	9	4	1	27	7	2.44
SNACK FOOD ASSOCIATION (SFA) TRIAL									
ND2676-10	24	1	1	0	0	0	26	92	0.12
AF1433-4	18	6	1	0	0	0	25	72	0.32
NY115	14	9	1	1	0	0	25	56	0.56
ATX85404-8	11	7	3	1	0	0	22	50	0.73
CHIPETA	12	8	3	0	1	1	25	48	0.92
MSNT-1	5	9	6	3	0	0	23	22	1.30
B0564-8	8	8	2	3	2	1	24	33	1.42
SNOWDEN	10	2	7	4	0	2	25	40	1.52
B0564-9	6	5	5	4	4	0	24	25	1.79
AF1668-60	6	7	2	8	3	2	28	21	2.04
MSE018-1	1	8	4	5	4	4	26	4	2.58
NY112	0	0	0	2	2	21	25	0	4.76

Michigan Table 9. LATE BLIGHT VARIETY TRIAL, Inoculated July 22, 1998. Rating based upon 28-day evaluation following inoculation.

1998 Field RAUDPC ¹ (Max = 100)			
Line	RAUDPC	Line	RAUDPC
LBR8	0.6	PICASSO	25.6
LBR9	1.1	P88-5-12	25.8
G274-3 ²	3.8	LILY	26.1
B0692-4	4.9	F105-10	26.5
Q237-25 ²	5.1	A091-1	26.6
AWN86514-2	5.2	LBRY	27.0
B0718-3	8.2	PIKE	27.1
LBR0	8.4	B1004-8	27.2
BZURA	10.1	H120-1	27.2
ROBIJN	12.1	LBR3 TBR	27.3
B0288-17	14.1	H018-3	27.6
ZAREVO	16.2	G124-8P	27.7
ELBA	17.1	G050-2	28.0
STOBRAWA	17.4	TURBO	28.5
LBR5	18.2	MATILDA	28.7
ND02438-7R	19.1	G104-6	28.7
A084275-3	19.3	MIRAKEL	28.8
DORITA	19.4	C103-2	29.1
LBR1R2R3R4	19.9	W1355-1	29.9
ARS4219-1	20.3	ND5084-3R ³	29.9
BERTITA	20.5	R BURBANK	32.8
GRETA	20.7	ATLANTIC	34.6
A080432-1	21.3	SNOWDEN	35.0
A84118-3	21.4	YUKON GOLD	35.8
LBR7	21.7	ONAWAY	36.6
B0811-13	22.2	R NORKOTAH	38.4
LBR2	24.3	SUPERIOR	39.4
A082611-7	24.4	SHEPODY	39.5
NORDONNA	25.1	SAG GOLD	42.5
B9922-11	25.4	E011-14	50.3

¹Ratings indicate the RAUDPC (Relative Area Under the Disease Progress Curve) over the entire plot.

²G274-3 and Q237-25 displayed foliar infection atypical of late blight, so the actual percentage due specifically to late blight lesions is less than reported.

³All other susceptible clones not listed except check varieties and the clone with the highest rating.

Michigan Table 10. 1998 FUSARIUM DRY ROT EVALUATION.

LINE	Avg. Depth (mm)	LINE	Avg. Depth (mm)	LINE	Avg. Depth (mm)
SNOWDEN	4.4	P84-9-8	11.2	W115IRUS	16.0
P83-11-5	4.5	F060-6	11.2	W1S75-30	16.1
R. NORKOTAH (LONG)	4.5	E192-8RUS	11.3	C103-2	16.2
A091-1	4.8	H308-2	11.3	ATLANTIC (DOHRW)	16.2
GOLDRUSH	5.1	H031-5	11.4	NY115	16.3
NORLAND	6.0	NORCHIP	11.6	G145-1	16.5
INNOVATOR	6.2	ONAWAY (DOHRW)	11.7	F090-9	16.7
G034-2	6.3	H419-1	11.7	E246-5	16.7
G049-4	6.3	B094-1	11.8	G227-2	16.8
SAXON	6.7	F099-3	11.9	A097-1Y	17.0
E263-10	6.7	NT-1	12.0	AF1753-16	17.1
F165-6RY	6.7	NAVAN	12.0	E226-4Y	17.3
RED PONTIAC	6.7	R. NORKOTAH (NC)	12.0	E149-5Y	17.4
SNOWDEN (NC)	6.9	F019-11	12.2	FAMBO	17.4
E080-4	6.9	MARIS BARD	12.2	F015-1	17.5
SNOWDEN (2X23)	7.3	RUSSET BURBANK (NC)	12.2	E028-1	17.7
YUKON GOLD	8.4	MATILDA	12.3	H369-2	17.7
G088-6 RUS	8.4	SNOWDEN (AD)	12.3	F313-3	17.8
H067-3	8.5	MN17572	12.7	ATLANTIC (ROBINSON)	18.0
SNOWDEN (DOHRW)	8.6	F373-8	12.8	SAGINAW GOLD	18.5
E030-4	8.6	PICASSO	12.8	H142-2	18.5
SUPERIOR (ROBINSON)	8.6	E084-5	12.9	B107-1	18.8
F420-1	8.7	ONAWAY (2X23)	13.2	G007-2	18.8
E192-8RUS	8.8	H061-1	13.2	ATLANTIC (2X23)	18.9
ACCENT	8.8	H130-2	13.2	AF1808-18	19.0
SHEPODY	8.9	LATONA	13.3	E033-1RD	19.2
ND 2470-27	9.0	H361-1	13.5	H392-1	19.3
ONAWAY (AD)	9.0	ND2676-10	13.5	G147-3P	19.3
H136-2	9.1	AF1763-2	13.7	E228-1	19.3
MIRAKEL	9.1	NY119	13.7	G297-4	19.4
ROCKET	9.2	H106-2	13.8	H086-3	19.5
H311-4	9.2	B106-7	13.9	H120-1	19.6
F349-1Y ROSE	9.2	LADY ROSETTA	14.0	G261-3	19.7
B073-2	9.3	H101-2Y	14.0	ND5084-3R	19.8
G077-7Y	9.4	G104-6	14.6	G257-7	20.3
MN16966	9.6	F059-1	14.8	DAL1	20.4
RUSSET BURBANK (LONG)	9.7	E074-1	14.8	F369-1RY	20.4
FV8957-10	9.7	UMATILLA R	14.8	G130-1	20.5
A091-1	9.7	LILY	14.8	E221-1	20.8
E222-5	9.9	E018-1	15.0	E228-9	21.1
G301-9	9.9	H098-2	15.0	ERNTESTOLZ	21.2
E274-4	10.1	A7961-1	15.0	E048-2Y	21.2
H351-6	10.2	C120-1Y	15.1	B040-3	21.9
F014-9	10.2	G139-1	15.3	E245-B	21.9
G050-2	10.3	H321-1	15.4	TURBO	22.1
F015-10	10.3	H095-4	15.6	ATLANTIC (AD)	22.7
F020-23	10.3	E230-6	15.6	CAESAR	23.4
A8495-1	10.4	ND4093-4RUS	15.7	E250-2	23.6
MS401-1	10.7	G015-C	15.8	G017-4	23.8
F001-2	10.7	AF1552-5	15.9	G119-1 RD	24.5
SUPERIOR (AD)	10.7	G274-3	15.9	B076-2	26.1
E040-6RY	10.9	MN17922	15.9	ATLANTIC (NC)	26.8
B073-2	10.9	G004-3	16.0	G141-3	29.0
NY121	11.0	C148-A	16.0	E011-14	29.6
LSD _{0.05}	8.1				

Minnesota Potato Breeding Program

Christian A. Thill

In collaboration with

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Breeding Objectives

1. Develop and distribute superior potato varieties and germplasm adapted to Minnesota, the North Central region, and the United States. Develop and distribute nationally and internationally enhanced clones for use in breeding for disease and insect pest resistance.
 - a. High yielding, yield stability over locations, and superior internal, external, and processing quality.
 - b. Resistance to potato diseases and insect pests.
 - c. Resistance to cold-sweetening - round white chipping types; storability and low reducing sugars - long processing types; earliness, and bright red periderm color that lacks sloughing - red types; new market opportunities - yellow flesh types.

Locations

Field experiments were conducted at six Minnesota (Grand Rapids, Becker, Rosemount, Crookston, Hollandale, Long Prairie) and one North Dakota (McLeod) locations. Grand Rapids is located in North Central Minnesota, is non-irrigated, has a cool, short (100 days)

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growing season, and has acid fine sandy forested soils. Becker is located in Central Minnesota, is irrigated, has Hubbard sandy soils, and has a 140 day growing season. Rosemount is located 30 miles South of St. Paul, Minnesota, is non-irrigated, has silt loam soils, and a 140 day growing season and is located in the Red River Valley of Minnesota. This site is non-irrigated with a 95-110 day growing season. Crookston has Fargo clay soils. Hollandale is located in South Central Minnesota, has organic peat soils, and a 120 day growing season. Long Prairie is located in Central Minnesota, has coarse sand soils, and a 120 day growing season. McLeod, North Dakota is located 30 miles south west of Fargo, ND and has sandy soils. Trials at Grand Rapids, Becker, Rosemount, and Crookston are located on Minnesota Agricultural Experiment Stations, while those at Hollandale, Long Prairie, and McLeod are located on grower fields.

Our use of these locations is partitioned such that Grand Rapids is the primary location for maintaining and increasing our selections for seed, Rosemount is used for disease screening, and the remaining locations are used for multiple selection environments. Typically, newer seedling selections are planted at multiple locations without replications, while preliminary advanced and advanced selections are planted at multiple locations with replications. All seedlings are evaluated for plant growth and tuber characteristics, total and marketable yield, specific gravity, the incidence of internal and external defects, and susceptibility to late blight, verticillium wilt, and common scab.

Stages to our Breeding Program

The initial stage of selection is done at Grand Rapids, MN on the single-hills of progeny. Subsequent selecting and evaluating (early generations) involves replicating promising seedlings across locations (Grand Rapids, Crookston, and Becker, MN) and evaluating them for agronomic, horticultural, and processing characteristics. Particular emphasis is placed on "market-limiting" traits i.e. resistance to cold-sweetening - round white chipping types; storability and low reducing sugars - long processing types; earliness, and bright red periderm color that lacks sloughing - red types. Additionally, disease and pest resistance screening for common scab (Grand Rapids, Becker, MN); Verticillium wilt (Grand Rapids, MN); Colorado potato beetle (CPB), late blight,

green peach aphid (GPA), PVY, and PLRV (Rosemount, MN) is done early.

Surviving seedlings are advanced (intermediate generations) and evaluated from replicated trials at Grand Rapids, Crookston, Becker, Long Prairie, Hollandale, MN, and McLeod, ND. Selections are evaluated for yield, yield stability, agronomic, horticultural, disease, internal and processing quality traits.

Advanced generation seedling selections are continuously being evaluated at the same locations in replicated trials; however, the 4 best selections are additionally entered in the North Central regional trials (13 locations). As seed becomes available, advanced selections are given to other regional testing programs.

Cultural management trials are being initiated to provide answers on how to grow promising new advanced seedlings before they are released to industry.

Early Generations

The winter 1997-1998 crossing produced 700 new hybrid families. Approximately three-fourths of this effort emphasized red clones for fresh market and russet/long and round-white clones for fresh market and processing. In determining the crosses to make major emphasis was placed on crossing varieties and advanced selections that were developed outside the Minnesota Breeding Program to clones developed "in-house". This was done to broaden the genetic base of our breeding population.

The remaining one-fourth crossing emphasis was placed on intermating and enhancing germplasm using "Genetic Series" clones unique to the Minnesota Potato Breeding Program and developed by Dr. Florian Lauer. The Genetic Series has both diploid and tetraploid clones developed for: 1) high protein, 17 clones; 2) chipping potential, 31 clones; 3) 2n pollen, 22 clones; 4) GPA resistance, 14 clones; 5) CPB resistance, 21 clones; 6) *S. andigena*, 19 clones; and 7) cold chipping, 10 clones. We have made progress breeding for aphid resistance using these clones.

New hybrid families are being generated in our winter 1999 crossing program. Emphasis is being placed on:

- 1) Developing high yielding, high quality fresh and processing reds (30%), longs (25%), and round whites (45%).
- 2) Broadening the genetic base of our parent population by using clones sourced nationally and internationally.
- 3) Evaluating and introgressing wild species germplasm for resistance to CPB, late blight, *Verticillium* wilt, common scab, silver scurf, and cold-sweetening.

New seedling progenies (first field generation 1997) were sown and transplanted to the field at Grand Rapids and Crookston, MN. We evaluated 55,000 new hybrid progenies. Of the 35,000 seedlings transplanted at Grand Rapids, 268 clones were selected and will be planted at Morris, MN as 12-hill plots (second field generation) in 1999. At Crookston 20,000 seedling tubers were planted and 106 were selected. Traditionally, selection intensity among the first year seedling progenies is mild due to being planted from transplants and having an 80-90 day growing season. This year however we applied heavy selection pressure. Moreover, at harvest we picked-up the whole-hill of potatoes instead of selecting just one 4-cut tuber from clones that had good tuber appearance.

We plant our second clonal generation tubers at Crookston, MN. The Crookston environment is severe in that it is characterized by heavy clay soils, is non-irrigated, and water can drain slowly; which, tends to result in tubers exhibiting malformation and/or other defects. We planted 10,000 clones and selected 250 to advance. These 250 will be planted at Morris, MN for seed, at Becker for yield, specific gravity, and horticultural and quality evaluations in 1999. Additionally, they will be planted in disease screening trials for determining resistance to scab, late blight, and *Verticillium* in 1999.

Intermediate Generations

One hundred twenty five clones were evaluated at three locations (Grand Rapids, Becker, and Crookston) for yield and horticultural quality and processing characteristics. This population can be partitioned into two groups 1) older (40-Hill Series), and 2) newer (20-Hill Series) selections. The older selections (70 clones) were planted at

the three locations, while the newer (145 clones) were evaluated from Grand Rapids and Becker. In addition to horticultural trials these clones were evaluated for resistance to scab (Tables 13 and 14) and late blight (Table 14). Few selections from the 20-Hill Series (Table 14) have scab resistance (Grand Rapids); however, 5 clones are segregating for moderate resistance to late blight. The 40-Hill Series was evaluated for late blight in 1998 and none were resistant. However, several of these clones have scab resistance (Table 13). Testing is continuing for total yield, US#1 yield, specific gravity, processing traits, agronomic and horticultural characteristics, and disease resistance.

Preliminary Advanced Seedling Trials (Preliminary Replicated Trials)

Thirty-eight clones were evaluated in Preliminary Replicated Trials at 4 locations, Becker-early (86 days) (Table 1), Becker-late (140 days) (Table 2), Crookston (120 days) (Table 3), and McLeod (120 days) (Table 4). Single-row plots were planted in a randomized complete block design with 2 replications of 20 hills. Seed piece spacing was 12" within row and 36" between rows. Standard crop management practices were used. Evaluated were plant vigor and maturity; tuber characteristics; tuber internal and external quality; graded total and US#1 yield and specific gravity in comparison to standard commercial cultivars.

Reds

Thirteen Minnesota seedling selections were compared to Dark Red Norland and Red Pontiac (Tables 1 to 4). Desired characteristics include early and late maturity, bright red colored skin that lacks fading, good skin set, and high yield. Yields tended to be highest at Becker (late) (Table 2) and ranged from 326 - 717 total cwt/A. Yields were lowest at Crookston (79 - 311 total cwt/A). These results can be expected; growing conditions at Crookston is non-irrigated and Becker is irrigated.

Minnesota seedlings MN 19088 at Becker (early) (Table 1); MN 18766, MN 19087, and MN 19088 at Becker (late) (Table 2); MN 18766, and MN 18774 at Crookston (Table 3) and McLeod (Table 4) have combined tuber quality, appearance and yields.

Russet / Longs

Four Minnesota seedling selections were compared to Goldrush, Russet Burbank, and Russet Norkotah (Tables 1 to 4). Yields were highest at Becker (late) (Table 2) and lowest at Crookston (Table 3). The seedlings performed differently across locations and specific gravity was generally low, but within the range of the commercial cultivars. Highest specific gravity was observed at Crookston (Table 3). Minnesota selection NM 18702 yielded 1015 total cwt/A at the late Becker harvest (Table 2). Tubers of this clone can be pointed, but it has good internal quality. At Crookston (Table 3) this clone yielded 100 cwt/A more than the cultivars and had a 1.098 specific gravity; internal quality is good. It appears that this clone does best under dry-land conditions.

Round Whites

Thirteen Minnesota seedling selections were compared to Atlantic, Norchip, and Snowden (Tables 1 to 4). In general, specific gravities are low. MN 19157 looks favorable early at Becker (Table 1) and at Crookston (Table 3).

Advanced Seedling Trials (Replicated Yield Trials)

Twenty-nine clones were evaluated in Replicated Yield Trials in six environments. Single-row plots were planted in a randomized complete block design with 2 replications of 20 hills. One location, Becker, Minnesota had two harvest dates, an early (Table 5, 86 days) and a late (Table 6, 140 days). The other locations were Crookston (Table 7), McLeod (Table 8), Long Prairie, (Table 9), and Hollandale (Table 10). Seed piece spacing was 12" within row and 36" between rows. Standard crop management practices were used.

Reds

Twelve Minnesota seedling selections were compared to Dark Red Norland and Red Pontiac (Tables 5 - 10). Yields tended to be highest at Becker (late) (Table 6) and Long Prairie (Table 9); intermediate at Crookston (Table 7), and Becker (early) (Table 5) and, lowest at Hollandale (Table 10). At the early Becker harvest (Table 5) all twelve seedlings yielded better than Dark Red Norland. MN 17922, and MN 17993 are both attractive and have 100

cwt/A greater yields than Dark Red Norland at Becker (early) (Table 5). MN 17922, MN 18049, and MN 18365 have high yields and good quality from the late Becker harvest (Table 6). Each of these three clones seems to perform well at other locations as well, with the exception of some pointed tubers in MN 18365 at Hollandale and Long Prairie.

MN 17922 was entered in the North Central Regional Trials and ranked third for overall merit ratings. This clone has been requested for trial from several breeding programs. It has a later maturity than Dark Red Norland; however, it must size-up early, since it has higher yields.

Russet / Long

Six Minnesota seedlings were compared to Goldrush, Russet Burbank, and Russet Norkotah (Tables 5 – 10). MN 18153 has favorable yield and quality early at Becker (Table 5) but not better than Russet Norkotah. Late at Becker (Table 6) MN 18142 (431 cwt/A) and MN 18714 (764 cwt/A) yield greater than the cultivars and have good specific gravity. MN 18713 looks good under dry-land growing (Crookston Table 7) it has yields similar to Goldrush, higher specific gravity, but 17% small size tubers.

Round Whites

Two Minnesota seedlings and the oval cream flesh variety Caesar from ZPC were compared to Atlantic, Itasca, and Snowden (Tables 5 – 10). MN 16966 has tremendous yielding potential, at 739 cwt/A at Becker (late) (Table 6). It does not perform as well under dry-land conditions (Crookston Table 7). It may be that this clone is best for the early chipping or fresh markets. Caesar has smooth attractive tubers and is good yielding. It seems that Caesar does best when harvested early to medium. Under a full season's growth Caesar tended to become unattractive due to pointed, and curved shaped tubers; especially in the larger tubers.

North Central Regional Potato Variety Trial

As part of our regional testing efforts North Central potato breeders enter their most advanced seedling selections in regional trials located at eight US and two Canadian locations. Minnesota's potato breeding program entered four clones in 1998: MN 16478 (white), MN 16966 (white), MN 17572 (red), and MN 17922

(red). Results from this trial at Becker, MN are presented (Table 15). MN 17922 ranked third among all entries for overall merit. It has excellent color and good internal quality. MN 16966 had the highest yields overall. It ranked high for merit in 1997 trials. This year in Alberta, Canada it was ranked the best new seedling. In our growing conditions MN 16966 has internal defects when grown on the sands. It had no defects when grown on dry-land (Table 7); however the yield potential dropped. The remaining two Minnesota selections will not be continued.

Disease Screening

Common scab

Each year Minnesota selections, germplasm used in breeding, and cultivars are assessed for resistance to common scab at Becker and Grand Rapids. Clones are evaluated for scab lesion type (0 = no scab to 5 = deep pitted scab), and scab coverage (T = trace to H = heavy). Presented in Tables 11, 12, 13 and 14 are the scab evaluations of our breeding germplasm "Genetic Series", 40-Hill Series, and 20-Hill Series respectively. Other germplasm (2x) are being evaluated for resistance (data not shown).

Late blight

In 1998 our late blight trial was conducted at Rosemount, MN. Two hundred forty-five Minnesota seedlings and breeding germplasm was evaluated in un-replicated plots, while advanced seedlings and cultivars from other US breeding programs and European varieties were evaluated from a replicated trial. The trial was planted June 9 and inoculated August 10 with the A2, US-8 genotype. Foliar readings were done on bi-weekly intervals from August 14 to September 12. A summary of the results from our breeding germplasm "Genetic Series" (Table 11 and 12) and our 20-Hill Series (Table 14) are presented. Some moderate resistance is segregating. Mostly, susceptibility was noted.

In related breeding experiments attempting to introgress late blight resistance to cultivated potatoes from wild species we have found that variability for late blight resistance segregates at the species, species accession, and among individual genotypes within species accession levels. The species identified as having the best resistance to late blight were *S. bulbocastanum*,

S. cardiophyllum, *S. pinnatisectum*, and *S. polyadenium*. The most resistant species accession was *S. bulbocastanum* 243512; which had a mean AUDPC score of 267, and 36 of 48 individual genotypes had no more than 25% plant defoliation from the disease.

In addition 95 resistant genotypes from 10 species across 28 accessions were selected for use in breeding. The somatic chromosome number of 1 EBN genotypes is being doubled *in vitro* and currently adventitious shoots are developing on leaf blade explants.

Verticillium wilt

Minnesota selections (4x) and other germplasm (2x) are being evaluated for resistance to *V. dahliae*. Field resistance is quantified on a 0 to 5 scale; 0 = 0 wilt, 1 = 1-12%, 2 = 13-25%, 3 = 26-50%, 4 = 51-75%, and 5 = 76-100% wilt. Germplasm showing field resistance will be evaluated in the laboratory for resistance using an assay to quantify vascular colonization. Seven resistant selections have been identified: MN 18751, MN 18815, MN 19167, MN 19174, MN 19175, MN 19189, and MN 19444. A second field evaluation is scheduled for 1999.

Colorado potato beetle

Minnesota germplasm "Genetic Series" (4x) (Tables 11 and 12) and other germplasm (2x) are being evaluated. Field resistance is quantified by percent plot defoliation. There are four germplasm selections with about 10% defoliation.

Green peach aphid, PVY, and PLRV

Minnesota germplasm "Genetic Series" (4x) (Tables 11 and 12) and other germplasm (2x and 4x) are being evaluated. Field resistance is quantified by counting the number of aphids that colonize potato leaf samples. The Genetic Series showed much variation for aphid resistance, test results ranged from 77 to 7600 aphids per plot (5 compound leaves from each of 4 plants). The number of aphids per plot for the cultivars were (363) Red Pontiac, (478) Russet Burbank, (740) Dark Red Norland, (3533) Goldrush, (3540) Norchip, (4640) Snowden, and (8400) Russet Norkotah aphids per plot. Twenty-one clones had better aphid resistance than Russet Burbank and six of these clones have been used in crosses to Snowden, Ranger Russet, La Chipper, and other

tuberosum germplasm.

A second group of material, the "Enhancement Series" (R. Hanneman Jr., University of Wisconsin, breeder), showed much variation for aphid resistance, which ranged from 4 to 1700 aphids per plant. Approximately 135 or 39% of the new hybrids had better aphid resistance than Russet Burbank. The best five families with resistance are:

E 1815, Atlantic x MN 85345 (92%),
E 1822, Snowden x MN 85348, (45%),
E 1827, W 1005 x MN 85348 (50%),
E 1833, MN 85348 x Ranger Russet (80%), and
E 1835, MN 85477 x Ranger Russet (67%).

Resistant genotypes will be ELISA tested for PLRV and PVY resistance. The best genotypes will be increased, and evaluated for agronomic, horticultural and processing characteristics.

Potato leafhopper

We evaluated 120 accessions from 32 *Solanum* species and found resistance to segregate between accessions and species. Twelve species from 31 accessions were subsequently evaluated to identify individual genotypes within accessions conferring resistance. Three species, *S. berthaultii* (PI's 208881, 320257, 473331, 498105), *S. megistacrolobum* (310936), and *S. polytrichon* (184770) had the best resistance against both PLH nymphs and adults. All genotypes within accessions of these species had greater than 5x the resistance of susceptible cultivars Russet Burbank and 15x that of Cascade.

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Minnesota Table 1. Preliminary Advanced Seedlings and Cultivars at Becker, Minnesota¹ in 1998.

Clone	Plant Growth ²		Tuber Characteristics ³							% Tuber Quality ⁴				Total Defects
	Vigor	Maturity	Shape	Size	Set	Shape Unif.	Size Unif.	Skin Maturity	App.	HH	IN	VD	BC	
REDS														
18068	2	2	3	M	6	6	6	6	7	0	0	0	0	0.0
18749	7	6.5	3	L-M	5	7.5	7	5	7	0	0	10	0	2.5
18752	3	3	5.5	M-S	5.5	6.5	6	7	5.5	0	0	0	0	0.0
18766	7	6	2	S	6.5	7	7.5	8	7.5	0	0	0	0	0.0
18774	6.5	7	2	S	6	5	5.5	7.5	5.5	0	0	0	0	0.0
19023	4.5	4	3.5	S-M	6.5	5	5	5	3.5	0	0	0	5	1.3
19044	2.5	3	4.5	M-S	6	6	6	7.5	5.5	5	0	0	0	1.3
19055	4	3	2	S	6.5	6	6	5.5	6.5	0	0	0	0	0.0
19087	5	4.5	3	L-M	5.5	6.5	7	4	6	0	0	0	0	0.0
19088	3	2	2.5	M	6	6.5	6	4	6.5	0	0	0	0	0.0
19113	3.5	3	2.5	S-M	4.5	4	4.5	4.5	3.5	0	5	0	0	1.3
19131	5	5.5	2	M-S	6.5	5.5	5.5	4.5	4.5	0	0	0	0	0.0
19223	8.5	9	2	A	3.5	5	4.5	4	4	0	0	5	0	1.3
D.R. Norland	1.5	1.5	3	M-L	5.5	7	6	7	6.5	0	0	0	0	0.0
R. Pontiac	7.5	8	3	M	5	4	5.5	5	4.5	20	0	5	0	6.3
RUSSET														
18096	4	4	6	M-S	6	6.5	6	5.5	5.5	5	0	5	5	3.8
18702	6.5	7	6.5	L-M	5.5	4.5	6	7	5.5	0	0	0	0	0.0
19167	8.5	8	6	S	2	2	6	4.5	2	0	0	0	0	0.0
19218	5.5	4.5	6	M-S	5	4.5	6	5.5	3.5	0	0	0	0	0.0
Goldrush	4.5	4	5.5	M-L	6	7.5	7.5	7	8	0	0	0	0	0.0
R. Burbank	7.5	8	5.5	M-S	5.5	3.5	5	5.5	3	30	0	0	40	17.5
R. Norkotah	3	3	5.5	L-M	5.5	7.5	7.5	6	8	0	10	10	0	5.0
WHITES														
18747	4.5	5	5	L	5	5	5.5	5.5	5.5	5	0	5	0	2.5
19002	5.5	6	4	L	3.5	3.5	5	5	4.5	0	0	0	10	2.5
19005	5.5	5.5	2	S-M	6.5	7.5	7.5	6.5	6	0	5	10	0	3.8
19031	2.5	3	2.5	S-M	3.5	4.5	4.5	5	4	10	0	0	15	6.3
19042	6	5.5	5	S-M	4	5	6	5	4.5	0	0	0	0	0.0
19050	6	6.5	2.5	M	6.5	6	6	6	6	0	0	0	0	0.0
19096	3	2.5	2.5	M	5	5	6	5	5.5	0	0	0	0	0.0
19106	4.5	4	2.5	S-M	5	5	6.5	5.5	4.5	0	0	0	0	0.0
19140	8.5	8	2.5	M	4	4	5.5	5.5	4.5	0	0	5	0	1.3
19157	3.5	3	2.5	M	6	7	7	6.5	7.5	0	10	5	0	3.8
19175	8	8.5	2	M-S	7	5.5	6	6	5.5	0	0	0	0	0.0
19199	7	7	2.5	M	6.5	7.5	7.5	6	6	0	0	10	0	2.5
19216	6.5	6	5.5	M	6	6.5	6	4	5	0	0	0	0	0.0
Atlantic	6	6.5	2	M-L	5.5	6.5	5.5	5.5	6	10	0	0	20	7.5
Norchip	4.5	3.5	2	M	6	6	6	5.5	6.5	15	5	10	15	11.3
Snowden	5	4.5	2.5	M	5.5	5.5	6	6	6	5	0	5	0	2.5

¹LocationEarly - Becker, MN (86 days).
(Irrigated)²Plant GrowthVigor - 1 (poor) - 9 (vigorous)
Maturity - 1 (early) - 9 (late)³Tuber CharacteristicsShape - 1 (round) - 9 (long)
Set - 1 (poor) - 9 (excellent)
Shape Uniformity - 1 (poor) - 9 (excellent)
Size Uniformity - 1 (poor) - 9 (excellent)
Skin Maturity - 1 (poor) - 9 (excellent)
Appearance - 1 (poor) - 9 (excellent)⁴% Tuber Quality (20 Tubers cut)HH - Hollow Heart
IN - Internal Necrosis
VD - Vascular Discoloration
BC - Brown Center

Minnesota Table 1. Continued.

Clone	Cwt/A		% of Total ⁵						A's	Sp. Gr.	Comments
	US#1	Total	Small	Med	Large	Over	Culls				
REDS											
18068	217.5	232.0	5	78	16	0	2	93.8	1.050	attr color, skins	
18749	235.6	257.4	6	44	48	0	3	91.5	1.057	good color	
18752	188.5	232.0	17	69	13	0	2	81.3	1.051	ex. color, long, knobs, too long	
18766	192.1	235.6	17	78	3	0	2	81.5	1.053	ex color, ex skin, needs size, h set b mkt	
18774	213.9	264.6	18	79	1	0	1	80.8	1.054	ex color, bright red, h set b mkt	
19023	235.6	300.9	17	69	10	0	5	78.3	1.063	pts, pink, oval long	
19044	181.3	232.0	22	77	2	0	0	78.1	1.064	ex color and skin, small now	
19055	257.4	319.0	19	72	5	5	0	80.7	1.052	ex color, small now, h set b mkt	
19087	257.4	286.4	9	42	32	16	1	89.9	1.046	nice color, skins	
19088	344.4	387.9	8	75	10	4	3	88.8	1.051	ex color, attr, skins	
19113	206.6	228.4	8	78	13	0	2	90.5	1.051	pink, some pts, stolons stick	
19131	282.8	358.9	20	74	5	0	1	78.8	1.058	pink, too pink	
19223	65.3	94.3	27	58	12	0	4	69.2	1.047	attr color and skin, few now, sticks	
D.R. Norland	340.8	373.4	7	63	28	0	2	91.3	1.057	pink, poor color	
R. Pontiac	279.1	311.8	9	69	20	1	1	89.5	1.047	rough, deep eyes, pink	
RUSSET											
18096	166.8	210.3	12	64	16	0	9	79.3	1.060	blky long, some gr cr	
18702	271.9	304.5	6	55	35	0	5	89.3	1.057	pts, end tapers, long, rough skn	
19167	32.6	61.6	47	53	0	0	0	52.9	1.058	pts, small	
19218	228.4	271.9	11	73	9	1	5	84.0	1.066	smooth, irr crescent shape	
Goldrush	282.8	304.5	5	67	26	0	2	92.9	1.059	smooth, attr	
R. Burbank	322.6	380.6	8	75	10	0	8	84.8	1.064	knobs, gr cr, 2nd growth	
R. Norkotah	311.8	329.9	3	70	23	1	2	94.5	1.063	attr, smooth, blky long	
WHITES											
18747	293.6	326.3	2	51	19	20	8	90.0	1.058	big, tends to long	
19002	184.9	210.3	5	53	29	5	7	87.9	1.058	irr, rough	
19005	210.3	250.1	16	80	4	0	0	84.1	1.060	ok, but small, needs size, pink eyes	
19031	137.8	166.8	13	61	15	7	4	82.6	1.056	un-attr	
19042	94.3	112.4	13	61	19	3	3	83.9	1.051	smooth, long	
19050	261.0	300.9	8	67	19	0	5	86.7	1.058	needs size, heavy set, few end fold	
19096	246.5	290.0	11	70	15	0	4	85.0	1.060	ok, few knobs	
19106	235.6	264.6	11	70	19	0	0	89.0	1.054	ok	
19140	188.5	206.6	7	46	37	9	2	91.2	1.063	un-attr	
19157	348.0	384.3	8	78	12	0	1	90.6	1.066	attr, small now	
19175	210.3	261.0	17	78	3	0	3	80.6	1.054	ok, needs size now	
19199	279.1	337.1	16	76	6	0	1	82.8	1.060	stolons stick	
19216	246.5	290.0	13	75	10	0	3	85.0	1.063	ok, skins, smooth, stolons	
Atlantic	333.5	362.5	6	44	37	11	2	92.0	1.069	few tubers	
Norchip	326.3	362.5	8	73	17	0	2	90.0	1.062	ok	
Snowden	261.0	279.1	6	49	38	6	0	93.5	1.068	attr	

¹LocationEarly - Becker, MN (86 days).
(Irrigated)⁵Tuber SizeSmall - < 1 7/8
Med - 1 7/8 - 2 1/4
Large - 2 1/4 - 3 1/2
Over - > 3 1/2

Minnesota Table 2. Preliminary Advanced Seedlings and Cultivars at Becker, Minnesota¹ in 1998.

Clone	Growth ²	Tuber ³	% Tuber Quality ⁴				Total Defects
	Maturity	App.	HH	IN	VD	BC	
<u>REDS</u>							
18068	1.75	4.5	0	0	0	0	0.0
18749	2	5	5	0	15	5	6.3
18752	2.75	4	0	0	5	5	2.5
18766	3.75	6	5	0	0	0	1.3
18774	3.25	5	0	0	5	0	1.3
19023	2.25	2.5	0	0	0	0	0.0
19044	2.5	2.5	0	10	0	0	2.5
19055	2	4.5	0	0	0	0	0.0
19087	1.75	4.5	0	0	0	0	0.0
19088	2	5.5	0	0	0	0	0.0
19113	2.75	1.5	0	0	5	5	2.5
19131	2.25	3	0	0	0	5	1.3
19223	4	3	15	0	0	0	3.8
D.R. Norland	3.25	3	0	0	0	5	1.3
R. Pontiac	3	2	5	0	5	0	2.5
<u>RUSSET</u>							
18096	2.75	3.5	20	0	0	0	5.0
18702	2	3.5	0	0	0	5	1.3
19167	4.5	2	20	15	5	0	10.0
19218	1.75	3.5	10	5	5	0	5.0
Goldrush	3.25	2	0	0	10	0	2.5
R. Burbank	3.5	2	40	0	0	10	12.5
R. Norkotah	2	5.5	0	0	0	0	0.0
<u>WHITES</u>							
18747	2	6	0	0	0	0	0.0
19002	3.25	3.5	5	15	0	0	5.0
19005	2.5	3.5	5	15	5	0	6.3
19031	2.25	2	0	0	0	0	0.0
19042	2.5	2.5	0	0	0	0	0.0
19050	2.75	4.5	0	0	0	10	2.5
19096	2.25	3.5	0	0	0	10	2.5
19106	2.75	4	0	50	0	0	12.5
19140	2	3.5	0	0	0	0	0.0
19157	3	5.5	0	10	0	5	3.8
19175	5	3.5	0	0	0	0	0.0
19199	2.25	3	15	0	0	0	3.8
19216	2	4.5	5	0	0	0	1.3
Atlantic	2.75	5	10	10	5	0	6.3
Norchip	3	4	0	15	5	0	5.0
Snowden	4	5.5	0	5	0	0	1.3

¹Location

Late - Becker, MN (140 days).
(Irrigated)

³Tuber Characteristics

Appearance - 1 (poor) - 9 (excellent)

²Plant Growth

Maturity - 1 (early) - 5 (late)

⁴% Tuber Quality (20 Tubers cut)

HH - Hollow Heart

IN - Internal Necrosis

VD - Vascular Discoloration

BC - Brown Center

Minnesota Table 2. Continued.

Clone	Cwt/A		% of Total ⁵						Sp. Gr.	Comments	
	US#1	Total	Small	Med	Large	Over	Culls	A's			
REDS											
18068	275.5	326.3	14	68	16	1	1	84.4	1.058	Uniform size and shape, smooth, skins, color ok	
18749	355.3	384.3	5	36	57	0	3	92.5	1.066	Attractive, uniform, excellent color, lots Grcr	
18752	304.5	358.9	13	61	24	0	2	84.8	1.063	Good skin, ok, long	
18766	503.9	543.8	7	73	19	0	1	92.7	1.069	Excellent color, uniform size and shape, some skins	
18774	395.1	482.1	16	62	20	0	2	82.0	1.072	Excellent color, uniform size and shape, B-mkt	
19023	525.6	601.8	10	59	27	1	3	87.3	1.072	Too pink, smooth, a lot here, pts, knobs	
19044	297.3	395.1	23	73	2	0	2	75.2	1.074	Oval, pale irr color	
19055	601.8	670.6	10	62	26	2	1	89.7	1.064	Uniform size and shape, some skin, good color	
19087	580.0	598.1	2	27	55	15	1	97.0	1.053	Gets big, blocky, can skin	
19088	496.6	536.5	7	62	30	0	0	92.6	1.053	Smooth, attractive, light skin, excellent	
19113	271.9	333.5	8	46	35	1	11	81.5	1.055	Knobs, 2nd growth, V. poor, pts, knobs	
19131	590.9	696.0	14	71	14	0	2	84.9	1.066	Heavy set, small, too pink	
19223	369.8	431.4	8	42	37	7	6	85.7	1.058	Irregular, 2nd growth, poor skin, rough	
D.R. Norland	380.6	413.3	7	73	19	0	1	92.1	1.055	Pale color, uniform size and shape, pink	
R. Pontiac	699.6	717.8	1	33	54	10	2	97.5	1.060	Irregular, deep eyes	
RUSSET											
18096	351.6	398.8	5	46	35	7	6	88.2	1.073	Irregular, lumpy	
18702	884.5	1015.0	5	43	29	15	8	87.1	1.074	Tends to point, Grcr	
19167	402.4	445.9	7	38	39	13	2	90.2	1.087	Heavy skin, points, var to small	
19218	369.8	438.6	12	57	22	5	3	84.3	1.068	Needs size, light rus, uniform shape	
Goldrush	442.3	551.0	5	47	22	11	15	80.3	1.060	V. irregular, off type	
R. Burbank	503.9	630.8	6	48	17	14	14	79.9	1.078	Long, irregular, knobs, 2nd growth	
R. Norkotah	511.1	540.1	5	63	30	2	0	94.6	1.070	Uniform size, variable shape, attr	
WHITES											
18747	529.3	543.8	1	42	49	7	1	97.3	1.062	Long, attractive, smooth, unif sz & shp, > Shepody	
19002	565.5	612.6	2	16	51	25	6	92.3	1.076	Big, blocky, irregular, deep eyes, heavy yield	
19005	464.0	514.8	10	56	33	1	0	90.1	1.070	Pink eyes, too variable	
19031	235.6	275.5	13	62	22	1	1	85.5	1.075	Too small, irr, lumpy	
19042	290.0	329.9	8	60	27	0	4	87.9	1.070	Long, too long for white, knobs, 2nd gr	
19050	594.5	638.0	5	45	47	1	2	93.2	1.078	Unif sz & sh, smooth, attractive, some lumpy	
19096	431.4	456.8	3	62	28	5	2	94.4	1.069	V. irregular, off type, too small	
19106	656.1	721.4	4	35	52	4	5	91.0	1.074	Blocky flat, uniform size and shape, 2nd growth	
19140	630.8	656.1	2	31	50	15	2	96.1	1.088	Variable size, ok, lt rus	
19157	438.6	478.5	7	65	26	1	2	91.7	1.072	Smal, round, all B's, unif sz & shp, attr, smooth	
19175	493.0	540.1	7	61	30	1	1	91.3	1.079	Uniform size, some rough, some 2nd gr	
19199	500.3	569.1	9	68	19	1	3	87.9	1.066	Small, uniform size and shape, some irregular	
19216	572.8	605.4	5	65	26	4	1	94.6	1.075	Long, smooth, attractive, better than Shepody	
Atlantic	362.5	398.8	6	48	39	4	3	90.9	1.087	Big, uniform shape, variable size	
Norchip	380.6	413.3	4	57	35	0	4	92.1	1.079	Uniform, ok, attractive	
Snowden	656.1	663.4	1	13	67	19	0	98.9	1.084	Attractive, uniform size and shape	

¹Location⁵Tuber SizeLate - Becker, MN (140 days).
(Irrigated)Small - < 1 7/8
Med - 1 7/8 - 2 1/4
Large - 2 1/4 - 3 1/2
Over - > 3 1/2

Minnesota Table 3. Preliminary Advanced Seedlings and Cultivars
at Crookston, Minnesota¹ in 1998.

Clone	Tuber ²	% Tuber Quality ³				Total Defects
	App.	HH	IN	VD	BC	
<u>REDS</u>						
18068	6	0	0	5	0	1.3
18749	4	0	0	0	0	0.0
18752	3	0	0	0	0	0.0
18766	6	0	0	0	0	0.0
18774	5	0	0	0	0	0.0
19023	3	0	0	0	0	0.0
19044	4	0	25	0	0	6.3
19055	6	0	0	0	0	0.0
19087	6	0	0	0	0	0.0
19088	4	0	5	0	0	1.3
19113	5	0	0	5	0	1.3
19131	3	0	0	0	0	0.0
19223	5	0	0	0	0	0.0
D.R. Norland	4	0	10	0	0	2.5
R. Pontiac	4	0	0	0	0	0.0
<u>RUSSET</u>						
18096	5	0	0	0	0	0.0
18702	6	0	5	0	0	1.3
19167	4	10	0	0	0	2.5
Goldrush	5	0	0	0	0	0.0
R. Burbank	2	0	5	5	0	2.5
R. Norkotah	7	0	0	10	0	2.5
<u>WHITES</u>						
18747	3	0	0	0	0	0.0
19002	4	0	0	0	0	0.0
19005	6	0	10	0	0	2.5
19031	4	0	0	0	0	0.0
19042	4	0	0	0	0	0.0
19050	5	0	0	0	0	0.0
19106	6	0	15	0	5	5.0
19140	4	0	0	0	0	0.0
19157	7	0	15	0	0	3.8
19175	2	0	0	5	0	1.3
19199	3	0	25	20	0	11.3
19216	6	0	0	0	0	0.0
Atlantic	6	5	0	0	0	1.3
Norchip	6	0	0	0	0	0.0
Snowden	6	5	0	0	35	10.0

¹Location

Crookston, MN (120 days).
(Dry-Land)

³% Tuber Quality (20 Tubers cut)

HH - Hollow Heart
IN - Internal Necrosis
VD - Vascular Discoloration
BC - Brown Center

²Tuber Characteristics

Appearance - 1 (poor) - 9 (excellent)

Minnesota Table 3. Continued.

Clone	Cwt/A		% of Total ⁴					Sp. Gr.	Comments	
	US#1	Total	Small	M - Lg	Over	Culls	A's			
<u>REDS</u>										
18068	141.4	155.9	9	72	19	0	90.7	1.067	Uniform, good color, ok	
18749	58.0	79.8	27	64	9	0	72.7	1.074	Pale color, small	
18752	68.9	101.5	32	64	4	0	67.9	1.083	Points	
18766	213.9	239.3	11	85	5	0	89.4	1.087	Round, attractive here, keep+++ , nice color	
18774	177.6	239.3	26	71	3	0	74.2	1.085	Bright red, V. attractive, keep+	
19023	134.1	199.4	33	62	5	0	67.3	1.100	Pale color	
19044	68.9	145.0	53	48	0	0	47.5	1.097	Stolons, too long & small	
19055	123.3	152.3	19	74	7	0	81.0	1.089	V. uniform, V. attractive, good color	
19087	246.5	271.9	9	57	33	0	90.7	1.067	Big, round, ok here	
19088	68.9	101.5	32	61	7	0	67.9	1.060	Small, pale color, pr, bruise	
19113	242.9	286.4	15	75	10	0	84.8	1.080	Attractive, some pale color	
19131	188.5	311.8	40	59	1	0	60.5	1.095	Round, small, pale color	
19223	203.0	224.8	10	53	37	0	90.3	1.081	Can get large and lumpy	
D.R. Norland	87.0	108.8	20	80	0	0	80.0	1.067	Small, ok skin color	
R. Pontiac	268.3	282.8	5	41	54	0	94.9	1.071	Lumpy, rough	
<u>RUSSET</u>										
18096	242.9	264.6	8	66	26	0	91.8	1.086	Blocky, V. attractive, keep++	
18702	373.4	402.4	7	58	35	0	92.8	1.098	Big, blocky, ok here, attr	
19167	101.5	130.5	22	75	3	0	77.8	1.085	Few, small, poor shape, pts, pr	
Goldrush	275.5	311.8	10	64	24	1	88.4	1.080	Mostly offshape	
R. Burbank	217.5	282.8	12	63	14	12	76.9	1.079	Rough, irregular, knobs	
R. Norkotah	279.1	304.5	8	54	38	0	91.7	1.085	V. attractive, long, unif	
<u>WHITES</u>										
18747	210.3	242.9	13	67	19	0	86.6	1.075	Points, pr	
19002	174.0	188.5	8	56	37	0	92.3	1.071	Round, ok here, keep+, lt yellow fl	
19005	224.8	253.8	11	70	19	0	88.6	1.084	Round, unif, ok here, attr	
19031	101.5	137.8	26	63	11	0	73.7	1.083	Small, lt yellow fl	
19042	116.0	130.5	11	78	11	0	88.9	1.080	V. poor, points	
19050	148.6	224.8	34	65	2	0	66.1	1.090	V. small, smooth, round, cr flesh, nice here	
19106	253.8	297.3	15	74	11	0	85.4	1.086	Round, unif size and shape, ok here	
19140	188.5	203.0	7	66	27	0	92.9	1.094	Round, nice here	
19157	224.8	271.9	17	71	12	0	82.7	1.090	Round, attractive here, ex here	
19175	221.1	279.1	21	70	9	0	79.2	1.077	Small, heat sprouts, late	
19199	217.5	264.6	18	73	10	0	82.2	1.092	Small, lumpy	
19216	199.4	261.0	24	71	6	0	76.4	1.092	Oval to round, attractive, too long	
Atlantic	315.4	333.5	5	60	35	0	94.6	1.101	Big, blocky, attractive	
Norchip	279.1	304.5	8	76	15	0	91.7	1.097	Round, attractive here, unif	
Snowden	163.1	188.5	13	83	4	0	86.5	1.094	Round, small, unif, attr	

¹Location⁴Tuber SizeCrookston, MN (120 days).
(Dry-Land)Small - < 1 7/8
Med - 1 7/8 - 2 1/4
Large - 2 1/4 - 3 1/2
Over - > 3 1/2

Minnesota Table 4. Preliminary Advanced Seedlings and Cultivars at
McLeod, North Dakota¹ in 1998.

Clone	Growth ²	Tuber ³	% Tuber Quality ⁴				Total
	Vigor	App.	HH	IN	VD	BC	Defects
<u>REDS</u>							
18068	2	4	0	0	5	0	1.3
18749	2.5	3	0	0	0	5	1.3
18766	3.5	4	0	0	0	0	0.0
18774	4.5	5.5	0	0	0	0	0.0
19044	3.5	5	5	15	5	0	6.3
19087	3	3.5	0	0	0	0	0.0
19088	2.5	4	0	0	0	0	0.0
19113	3	2	0	20	5	0	6.3
19131	3	2.5	0	15	5	0	5.0
D.R. Norland	3.5	5	5	0	0	0	1.3
R. Pontiac	3	1.5	0	0	20	0	5.0
<u>RUSSET</u>							
18096	2.5	2.5	0	0	10	0	2.5
18702	2	3.5	0	5	0	0	1.3
19167	3.5	2	0	0	0	0	0.0
Goldrush	3	4	10	0	5	0	3.8
R. Burbank	4	3	0	0	0	0	0.0
R. Norkotah	2.5	6	0	0	0	5	1.3
<u>WHITES</u>							
18747	2.5	1	0	0	5	0	1.3
19002	3	4.5	0	20	0	0	5.0
19031	3	3	0	0	0	0	0.0
19042	2	2	0	0	5	0	1.3
19050	4	3	0	15	0	0	3.8
19106	3.5	3	0	25	15	0	10.0
19140	4.5	4	0	0	0	0	0.0
19157	4.5	5	0	10	10	10	7.5
19175	4	3.5	0	10	0	0	2.5
19199	3.5	3	10	0	15	0	6.3
19216	4.5	3.5	0	0	10	0	2.5
Atlantic	3.5	4.5	10	15	0	15	10.0
Norchip	3	4	0	5	5	0	2.5
Snowden	4.5	5.5	5	5	0	0	2.5

¹Location

McLeod, ND (120 days).
(Irrigated)

³Tuber Characteristics

Appearance - 1 (poor) - 9 (excellent)

²Plant Growth

Vigor - 1 (poor) - 9 (vigorous)

⁴% Tuber Quality (20 Tubers cut)

HH - Hollow Heart
IN - Internal Necrosis
VD - Vascular Discoloration
BC - Brown Center

Minnesota Table 4. Continued.

Winkler Table 4: Continued.

Clone	Cwt/A		% of Total ⁵						Sp. Gr.	Comments
	US#1	Total	Small	M - Lg	Over	Culls	A's			
<u>REDS</u>										
18068	177.6	188.5	6	71	23	0	94.2	1.054	Pale color, round, ok shape	
18749	311.8	326.3	4	56	40	0	95.6	1.072	Good color, some rough	
18766	242.9	264.6	8	77	15	0	91.8	1.070	Bright red	
18774	213.9	275.5	22	64	13	0	77.6	1.073	Excellent color, ok, smooth	
19044	253.8	297.3	15	70	16	0	85.4	1.078	Good color, small, scab	
19087	239.3	257.4	6	34	59	1	93.0	1.054	Blocky, ok color, skins	
19088	137.8	181.3	24	66	10	0	76.0	1.054	Light set and yield, small	
19113	210.3	253.8	17	66	17	0	82.9	1.063	Stolons, light color, round	
19131	304.5	395.1	23	68	9	0	77.1	1.078	Small, poor color	
D.R. Norland	250.1	264.6	5	74	21	0	94.5	1.066	Pale color, deep eyes, uniform	
R. Pontiac	271.9	286.4	5	53	42	0	94.9	1.058	Knobs, rough	
<u>RUSSET</u>										
18096	337.1	358.9	6	51	43	0	93.9	1.065	Severe, GrCr	
18702	239.3	253.8	6	61	33	0	94.3	1.071	Rough, GrCr, points, rot	
19167	83.4	112.4	26	65	10	0	74.2	1.079	Small, points	
Goldrush	369.8	402.4	6	59	32	2	91.9	1.067	Ok here, big	
R. Burbank	242.9	297.3	18	68	13	0	81.7	1.069	Ok here, small	
R. Norkotah	279.1	300.9	7	61	31	0	92.8	1.071	Keep, ok here	
<u>WHITES</u>										
18747	224.8	235.6	5	43	52	0	95.4	1.062	Long, H2O damage, FF	
19002	300.9	315.4	3	51	45	1	95.4	1.067	Keep, light yellow fl.	
19031	134.1	166.8	20	59	22	0	80.4	1.073	Water damage	
19042	210.3	224.8	6	73	21	0	93.5	1.066	Long, rough, FF	
19050	246.5	275.5	11	70	20	0	89.5	1.073	Rough, irregular	
19106	246.5	282.8	13	73	14	0	87.2	1.067	Lumpy	
19140	319.0	329.9	3	45	52	0	96.7	1.082	Ok here	
19157	337.1	406.0	17	70	13	0	83.0	1.113	Medium size, round, uniform	
19175	224.8	261.0	14	79	7	0	86.1	1.063	Lumpy	
19199	315.4	355.3	11	63	26	0	88.8	1.080	Sticking stolons, knobs	
19216	253.8	308.1	18	67	15	0	82.4	1.082	Long, deep scab, some points	
Atlantic	329.9	344.4	4	57	39	0	95.8	1.078	Round, deep pit scab	
Norchip	290.0	319.0	9	74	17	0	90.9	1.094	Small	
Snowden	242.9	257.4	6	72	23	0	94.4	1.081	Uniform	

¹Location⁵Tuber SizeMcLeod, ND (120 days).
(Irrigated)Small - < 1 7/8
Medium - Large - 1 7/8 - 3 1/2
Over - > 3 1/2

Minnesota Table 5. Advanced Seedlings and Cultivars at Becker, Minnesota¹ in 1998.

Clone	Plant Growth ²		Tuber Characteristics ³							% Tuber Quality ⁴				Total Defects
	Vigor	Maturity	Shape	Size	Set	Shape Unif.	Size Unif.	Skin Maturity	App.	HH	IN	VD	BC	
REDS														
17572	3	2	3	M-S	5.5	6.5	6.5	7	6.5	0	0	0	5	1.3
17578	4	3.5	3.5	M-L	5	6.5	6.5	7	7	0	0	0	0	0.0
17922	4.5	4.5	2.5	L	6	6	6.5	4.5	5.5	0	5	0	0	1.3
17941	4	3.5	4	L-M	5	4	3	4	2.5	0	0	0	0	0.0
17989	3.5	2.5	4	M-S	5	6	5.5	4	4	0	0	5	5	2.5
17993	4	3	3	M	5.5	6	6	5.5	7	5	0	10	0	3.8
18049	3	3.5	4	M-S	4	4.5	5	4	3	0	0	0	0	0.0
18365	3.5	2.5	4.5	M-L	6.5	5	6.5	7.5	6	0	0	0	0	0.0
18370	5	5.5	3	M	4.5	5	6	8	5	5	5	0	0	2.5
18768	5.5	5.5	5	L-M	5	5	5.5	5.5	4	0	5	0	5	2.5
18772	6.5	6	2	M-L	5.5	7	7	4	7.5	0	0	0	5	1.3
18808	6.5	6	5	M-L	5.5	5	5.5	5.5	3.5	5	10	10	0	6.3
D.R. Norland	3.5	2.5	4	M	5	5.5	5.5	4	4	0	0	10	10	5.0
R. Pontiac	7	6	2.5	L-M	5	4	5	4	2.5	15	0	0	0	3.8
RUSSET														
16478	9	8.5	5.5	M-L	5	5.5	6	5.5	6.5	5	0	10	0	3.8
18142	6.5	6	6	M-L	5	6.5	7.5	8	6.5	10	5	0	0	3.8
18153	5	4.5	6	L	5	6.5	7	6	7	0	0	0	0	0.0
18710	7.5	6.5	5	S-M	4.5	5	6	6.5	4.5	0	0	5	0	1.3
18713	5.5	5	6	L-M	5.5	6.5	7	7	7	5	0	5	0	2.5
18714	4.5	4.5	4.5	M-S	5.5	5	6	6	4.5	0	0	5	0	1.3
Goldrush	4	3	6	M	5.5	6.5	6.5	6.5	7	0	0	0	0	0.0
R. Burbank	7	7.5	5.5	S-M	5.5	3	3.5	5	3	5	0	0	30	8.8
R. Norkotah	2.5	2	6.5	L	6	8	8	7	8	0	5	0	0	1.3
WHITES														
16966	7	6	2.5	S-M	6.5	5	5.5	5.5	4.5	0	0	0	10	2.5
17662	4.5	4	3.5	L-M	5	5.5	5	5.5	5	0	10	5	0	3.8
Atlantic	6	6	2.5	L-M	4.5	5	5	4.5	5	35	0	5	35	18.8
Caesar	8	8.5	5	M-L	5.5	6	6	7	7	0	0	0	5	1.3
Itasca	5.5	5.5	4.5	L-M	6	3.5	5	3	3.5	0	0	0	0	0.0
Snowden	6.5	5.5	2	M-L	4.5	5.5	4.5	5	6	0	5	10	0	3.8

¹Location

Early - Becker, MN (86 days).
(Irrigated)

²Plant Growth

Vigor - 1 (poor) - 9 (vigorous)
Maturity - 1 (early) - 9 (late)

³Tuber Characteristics

Shape - 1 (round) - 9 (long)
Set - 1 (poor) - 9 (excellent)
Shape Uniformity - 1 (poor) - 9 (excellent)
Size Uniformity - 1 (poor) - 9 (excellent)
Skin Maturity - 1 (poor) - 9 (excellent)
Appearance - 1 (poor) - 9 (excellent)

⁴% Tuber Quality (20 Tubers cut)

HH - Hollow Heart
IN - Internal Necrosis
VD - Vascular Discoloration
BC - Brown Center

Minnesota Table 5. Continued.

Minnesota Table 5. Continued.

Clone	Cwt/A		% of Total ⁵						A's	Sp. Gr.	Comments
	US#1	Total	Small	Med	Large	Over	Culls				
REDS											
17572	293.6	326.3	10	61	26	3	0	90.0	1.051	rnd, attr, good skn	
17578	224.8	242.9	6	52	36	4	1	92.5	1.058	attr, god skn	
17922	275.5	297.3	6	40	48	5	1	92.7	1.054	nice, skins	
17941	213.9	250.1	9	58	22	6	6	85.5	1.053	l. oval	
17989	275.5	308.1	8	64	26	0	2	89.4	1.054	smooth, long	
17993	304.5	322.6	4	83	10	1	1	94.4	1.066	attr, needs size	
18049	257.4	293.6	10	68	20	0	2	87.7	1.058	skins, few pts	
18365	250.1	275.5	8	80	11	0	1	90.8	1.055	ex. Skin, tend to pt, long	
18370	319.0	351.6	8	75	15	0	1	90.7	1.052	rnd, nice, few pts	
18768	286.4	308.1	7	71	22	0	0	92.9	1.051	too pink, long	
18772	195.8	221.1	8	51	34	3	3	88.5	1.046	skins, attr, rnd	
18808	242.9	279.1	8	70	16	1	5	87.0	1.053	lots of pts, long	
D.R. Norland	188.5	213.9	8	64	24	0	3	88.1	1.055	tends to pt, long	
R. Pontiac	286.4	311.8	6	63	24	5	2	91.9	1.047	deep eyes	
RUSSET											
16478	275.5	290.0	5	76	19	0	0	95.0	1.069	blky oval, ex shape unif	
18142	221.1	282.8	5	53	23	3	17	78.2	1.055	alleg skn, gr cr	
18153	329.9	355.3	3	60	26	7	4	92.9	1.064	flat long oval, attr	
18710	235.6	261.0	8	81	10	0	1	90.3	1.061	needs size now, blky oval, few pts	
18713	319.0	337.1	5	59	34	1	0	94.6	1.060	blky long oval, heavy skin	
18714	235.6	261.0	8	79	10	1	1	90.3	1.060	v. small	
Goldrush	286.4	319.0	8	61	27	1	2	89.8	1.057	blky oval long	
R. Burbank	203.0	250.1	7	80	1	0	12	81.2	1.065	knobs, irr	
R. Norkotah	344.4	366.1	3	58	33	3	3	94.1	1.061	attr, nice, blky	
WHITES											
16966	326.3	362.5	8	73	14	3	2	90.0	1.062	pts, un-attr, scab-2	
17662	304.5	333.5	8	55	36	0	1	91.3	1.057	un-attr	
Atlantic	250.1	275.5	7	45	32	14	3	90.8	1.068	rough	
Caesar	300.9	315.4	5	78	17	0	0	95.4	1.056	smooth, attr, flat, few pts	
Itasca	337.1	362.5	5	67	25	1	2	93.0	1.060	irr shp	
Snowden	246.5	264.6	4	49	37	7	3	93.2	1.072	end tends to fold	

¹Location⁵Tuber SizeEarly - Becker, MN (86 days).
(Irrigated)Small - < 1 7/8
Med - 1 7/8 - 2 1/4
Large - 2 1/4 - 3 1/2
Over - > 3 1/2

Minnesota Table 6. Advanced Seedlings and Cultivars at Becker,
Minnesota¹ in 1998.

Clone	Growth ²	Tuber ³	% Tuber Quality ⁴				Total Defects
	Maturity	App.	HH	IN	VD	BC	
<u>REDS</u>							
17572	3	4.5	0	0	0	5	1.3
17578	1.75	5.5	0	0	0	0	0.0
17922	1	6	0	0	10	0	2.5
17941	1.25	3.5	0	0	5	0	1.3
17989	2.5	5	0	0	0	0	0.0
17993	2	5.5	0	0	0	0	0.0
18049	1.75	4.5	0	0	5	0	1.3
18365	2	6	0	0	0	0	0.0
18370	2.5	4	0	5	0	0	1.3
18768	2.25	3.5	0	5	0	5	2.5
18772	1	5	0	0	5	0	1.3
18808	1.25	4	5	0	0	5	2.5
D.R. Norland	1	2.5	5	0	0	5	2.5
R. Pontiac	2.25	3	0	0	5	0	1.3
<u>RUSSET</u>							
16478	1.5	4.5	0	5	0	5	2.5
18142	1.5	6	5	0	0	0	1.3
18153	2.75	4.5	0	0	0	0	0.0
18710	1.5	4	0	0	0	0	0.0
18713	2.25	5	0	0	0	0	0.0
18714	1.25	5	0	0	5	0	1.3
Goldrush	1.5	3.5	5	0	0	0	1.3
R. Burbank	2.25	2	25	5	0	25	13.8
R. Norkotah	1	5	0	0	0	0	0.0
<u>WHITES</u>							
16966	2	5	0	50	5	0	13.8
17662	1	4	0	20	0	0	5.0
Atlantic	1.5	5.5	10	25	0	0	8.8
Caesar	4	4	5	0	0	0	1.3
Itasca	1.75	5.5	0	0	0	0	0.0
Snowden	2	4.5	5	0	0	10	3.8

¹Location

Late - Becker, MN (140 days).
(Irrigated)

³Tuber Characteristics

Appearance - 1 (poor) - 9 (excellent)

²Plant Growth

Maturity - 1 (early) - 5 (late)

⁴% Tuber Quality (20 Tubers cut)

HH - Hollow Heart
IN - Internal Necrosis
VD - Vascular Discoloration
BC - Brown Center

Minnesota Table 6. Continued.

Minnesota Table 6: Continued.											
Clone	Cwt/A		% of Total ⁵						A's	Sp. Gr.	Comments
	US#1	Total	Small	Med	Large	Over	Culls				
<u>REDS</u>											
17572	547.4	601.8	9	71	20	0	0	91.0	1.056	Lots of small, color ok	
17578	348.0	366.1	5	61	34	0	0	95.0	1.058	Excellent color, variable size, attr, ok color	
17922	442.3	467.6	5	40	51	4	1	94.6	1.056	Excellent here, can skin, v. attr	
17941	402.4	431.4	4	52	39	3	3	93.3	1.054	Ok color, too long, big get lumpy	
17989	518.4	554.6	5	40	49	5	1	93.5	1.073	Attractive, oval to long	
17993	485.8	518.4	6	71	22	0	1	93.7	1.064	Medium size, good, unif sz & shp	
18049	460.4	500.3	6	55	37	0	2	92.0	1.056	Skins, high set, ex color	
18365	416.9	474.9	11	73	15	0	1	87.8	1.051	Oval, uniform size and shape, excellent color	
18370	500.3	532.9	5	59	35	0	1	93.9	1.065	Uniform size and shape, tough skin, ok color	
18768	474.9	503.9	6	58	36	0	0	94.2	1.057	Long, light color, too long	
18772	445.9	464.0	3	38	58	0	1	96.1	1.058	1 GrCr, pink, keep	
18808	522.0	561.9	5	50	43	0	3	92.9	1.063	Points, gets lumpy, big yield, long	
D.R. Norland	340.8	362.5	6	63	31	0	0	94.0	1.053	Drop, pale color	
R. Pontiac	645.3	674.3	3	40	52	3	2	95.7	1.060	Deep eyes, high set, irr	
<u>RUSSET</u>											
16478	616.3	627.1	2	48	50	0	0	98.3	1.081	Few knobs, blocky, lt rus	
18142	395.1	431.4	3	66	25	0	5	91.6	1.066	V. attractive, smooth, unif	
18153	601.8	627.1	3	42	51	3	1	96.0	1.071	Blocky, can point, keep	
18710	609.0	630.8	3	53	44	0	1	96.6	1.063	Large, long, Pair tendency, keep	
18713	598.1	627.1	3	46	49	0	1	95.4	1.074	Can bottle, attractive, smooth	
18714	725.0	764.9	4	54	41	0	1	94.8	1.076	Blocky to oval	
Goldrush	438.6	565.5	3	47	31	0	19	77.6	1.069	Knobs, irregular, bottle, drop	
R. Burbank	482.1	558.3	6	69	18	0	8	86.4	1.075	Knobs, rough,irregular, drop	
R. Norkotah	406.0	449.5	9	76	15	0	1	90.3	1.064	Small,uniform size and shape, too small, attr	
<u>WHITES</u>											
16966	739.5	783.0	5	44	50	0	1	94.4	1.077	High set, ok here, pts	
17662	554.6	580.0	4	33	61	1	1	95.6	1.066	Large oval,some points, lots here	
Atlantic	569.1	587.3	2	30	57	9	1	96.9	1.082	Keep	
Caesar	677.9	706.9	3	38	57	0	1	95.9	1.073	Long, smooth, uniform sz & shp, curve & point	
Itasca	576.4	605.4	4	56	40	0	1	95.2	1.067	Blocky, big, attractive, smooth, uniform	
Snowden	735.9	746.8	1	21	62	16	0	98.5	1.083	Uniform size and shape, end folds, rough	

¹Location⁵Tuber SizeLate - Becker, MN (140 days).
(Irrigated)Small - < 1 7/8
Med - 1 7/8 - 2 1/4
Large - 2 1/4 - 3 1/2
Over - > 3 1/2

Minnesota Table 7. Advanced Seedlings and Cultivars at Crookston, Minnesota¹ in 1998.

Clone	Tuber ² App.	% Tuber Quality ³					Cwt/A		% of Total ⁴					Sp. Gr.	Comments
		HH	IN	VD	BC	Total Defects	US#1	Total	Small	M-Lg	Over	Culls	A's		
REDS															
17572	4	0	0	20	0	5.0	101.5	123.3	18	79	3	0	82.4	1.068	Good color skin, small
17578	3	0	0	0	0	0.0	116.0	137.8	16	79	5	0	84.2	1.067	Round to oval, buck-skin
17922	6	0	0	0	0	0.0	304.5	311.8	2	50	48	0	97.7	1.076	Round, large, uniform size and shape, excellent
17989	5	0	0	0	0	0.0	402.4	416.9	3	50	46	0	96.5	1.086	Round, blocky, skins, keep++, ex color
17993	5	0	0	0	0	0.0	217.5	261.0	13	60	24	4	83.3	1.085	Excellent color, shape and size ++
18049	6	0	0	0	0	0.0	282.8	300.9	6	71	23	0	94.0	1.076	Round, attractive, poor skins, ok
18365	3	0	0	0	0	0.0	192.1	250.1	23	74	3	0	76.8	1.072	Lots of scurf, round, uniform, keep+
18370	5	0	10	0	0	2.5	253.8	290.0	13	81	6	0	87.5	1.072	Large to Medium, round, color can fade
18768	5	0	0	0	0	0.0	311.8	329.9	4	79	15	1	94.5	1.075	Oval, smooth, high set
18772	5	0	0	0	0	0.0	322.6	337.1	4	48	47	0	95.7	1.067	Attractive, round, ex size & color
18808	3	0	0	0	0	0.0	275.5	293.6	6	58	36	0	93.8	1.078	Long, poor color, keep+
D.R. Norland	4	0	0	0	0	0.0	112.4	134.1	14	59	24	3	83.8	1.065	Round, pale, ok, poor color
R. Pontiac	3	0	0	25	0	6.3	319.0	329.9	3	38	58	0	96.7	1.077	Deep eyes, rough
RUSSET															
16478	5	0	0	5	0	1.3	242.9	257.4	6	70	24	0	94.4	1.097	Light rus, blocky, good size
18142	5	0	0	5	0	1.3	261.0	282.8	8	53	40	0	92.3	1.077	Blocky, points, tough skin
18710	5	0	0	5	0	1.3	369.8	387.9	5	68	27	0	95.3	1.090	Big blocky, GrCr, round rus
18713	5	0	0	10	0	2.5	290.0	358.9	17	76	5	2	80.8	1.093	Long oval, smooth attractive, needs size, keep++
18714	5	0	0	0	0	0.0	282.8	315.4	10	62	28	0	89.7	1.085	Blocky, oval to long, smooth, V. attractive
Goldrush	4	5	0	5	0	2.5	333.5	369.8	10	68	23	0	90.2	1.080	Ok here, lots of points
R. Burbank	3	0	0	0	0	0.0	235.6	264.6	11	73	16	0	89.0	1.080	Long, bottle, curves, thin, deep eyes, offshape
R. Norkotah	8	0	0	0	0	0.0	235.6	261.0	10	60	31	0	90.3	1.080	V. attractive, long, smooth, few curves
WHITES															
16966	2	0	0	0	0	0.0	192.1	261.0	26	69	4	0	73.6	1.086	Small, rough, H2O, offshape
17662	6	0	0	0	0	0.0	253.8	279.1	9	78	13	0	90.9	1.092	Oval, medium to large, smooth, uniform
Atlantic	7	10	15	0	5	7.5	206.6	235.6	8	74	14	5	87.7	1.096	Blocky, attractive, tough skin
Caesar	6	0	5	5	0	2.5	409.6	431.4	5	87	8	0	95.0	1.083	Long, smooth, oval, ok here, large
Itasca	4	0	0	0	0	0.0	297.3	322.6	8	79	13	0	92.1	1.079	Oval, variable size, can point, gets long
Snowden	6	0	0	0	0	0.0	261.0	271.9	4	83	13	0	96.0	1.102	V. attractive, round, attr

¹Location³% Tuber Quality (20 Tubers cut)⁴Tuber SizeCrookston, MN (120 days).
(Dry-Land)HH - Hollow Heart
IN - Internal Necrosis
VD - Vascular Discoloration
BC - Brown Center²Tuber CharacteristicsSmall - < 1 7/8
Med - 1 7/8 - 2 1/4
Large - 2 1/4 - 3 1/2
Over - > 3 1/2

Appearance - 1 (poor) - 9 (excellent)

Minnesota Table 8. Advanced Seedlings and Cultivars at McLeod, North Dakota¹ in 1998.

Clone	Growth ²	Vigor	Tuber ³	% Tuber Quality ⁴					Cwt/A		% of Total ⁵					Sp. Gr. Comments	
				App.	HH	IN	VD	BC	Total Defects	US#1	Total	Small	M-Lg	Over	Culls		A's
REDS																	
17572	3.5	4	0	0	5	0	1.3	163.1	177.6	8	71	20	0	91.8	1.056	Gets irregular, good color	
17578	2.5	3	0	0	0	0	0.0	108.8	123.3	12	71	18	0	88.2	1.059	Excellent color	
17922	3	5.5	0	0	5	0	1.3	362.5	377.0	4	59	38	0	96.2	1.058	Attractive, skins, some stolons	
17989	2.5	4	0	10	10	0	5.0	181.3	203.0	11	50	39	0	89.3	1.067	Long, skins, has size, some lumpy	
17993	3	3	0	0	0	0	0.0	199.4	228.4	13	68	19	0	87.3	1.059	Excellent color, oval, ok here	
18049	3.5	4	5	5	10	0	5.0	340.8	362.5	6	56	38	0	94.0	1.062	Good size, skinning	
18365	4	5	0	10	10	0	5.0	279.1	333.5	16	71	13	0	83.7	1.062	Round, good color, ok	
18808	3	2.5	0	5	0	0	1.3	221.1	250.1	10	48	41	1	88.4	1.058	Long, pale, deep eyes	
D.R. Norland	2	3	0	0	5	5	2.5	297.3	315.4	6	53	41	0	94.3	1.062	Rough, irregular, deep eyes	
R. Pontiac	3	1	0	0	10	0	2.5	402.4	416.9	3	44	52	0	96.5	1.062	Rough, irregular	
RUSSET																	
16478	3	4	0	5	10	0	3.8	232.0	246.5	6	63	31	0	94.1	1.085	Light rus, blocky, irr, deep eyes	
18142	3.5	6	0	5	0	0	1.3	228.4	246.5	7	59	34	0	92.6	1.069	Big, blocky, attractive	
18713	4	5.5	10	0	15	0	6.3	337.1	377.0	11	63	27	0	89.4	1.069	Ok here, some lumpy	
Goldrush	3.5	4	5	0	10	0	3.8	380.6	416.9	9	63	28	0	91.3	1.072	Ok here, points	
R. Burbank	4.5	3.5	10	0	0	0	2.5	293.6	348.0	16	72	13	0	84.4	1.074	Some lumpy, most ok here	
R. Norkotah	3	7	0	0	0	0	0.0	344.4	358.9	4	46	49	0	96.0	1.071	Ok here	
WHITES																	
16966	3.5	5	0	5	15	0	5.0	489.4	518.4	6	67	27	0	94.4	1.073	Ok here, Lt yellow fl.	
17662	4	5	0	5	0	0	1.3	308.1	333.5	8	68	24	0	92.4	1.078	Long, ok here	
Atlantic	3.5	5	10	10	0	0	5.0	253.8	279.1	8	64	27	1	90.9	1.083	Ok here, uniform	
Caesar	2.5	1.5	0	0	10	0	2.5	188.5	224.8	16	74	10	0	83.9	1.064	Lots of points	
Itasca	4	4.5	10	5	5	0	5.0	213.9	242.9	9	67	21	3	88.1	1.074	Long, ok here	
Snowden	4.5	6	0	0	0	0	0.0	326.3	344.4	5	76	19	0	94.7	1.083	Round, unif, medium size	
¹ Location	² Plant Growth			⁴ % Tuber Quality (20 Tubers cut)					⁵ Tuber Size								
McLeod, ND (120 days). (Irrigated)	Vigor - 1 (poor) - 9 (vigorous)			HH - Hollow Heart IN - Internal Necrosis VD - Vascular Discoloration BC - Brown Center					Small - < 1 7/8 Medium - Large - 1 7/8 - 3 1/2 Over - > 3 1/2								
³ Tuber Characteristics																	
Appearance - 1 (poor) - 9 (excellent)																	

Minnesota Table 9. Advanced Seedlings and Cultivars at Long Prairie, Minnesota¹ in 1998.

Clone	Growth ²		Tuber Characteristics ³						% Tuber Quality ⁴				
	Vigor	Shape	Size	Set	Shape Unif.	Size Unif.	Skin Maturity	App.	HH	IN	VD	BC	Total Defects
REDS													
17572	9	2	M	6	4.5	4	4.5	4.5	0	0	0	5	1.3
17578	5	2	M-L	7	5.5	6	7	6	0	0	0	0	0.0
17922	5.5	2.5	L	5	6.5	6.5	4.5	6.5	0	0	10	0	2.5
17989	4.5	3	M	4.5	4.5	4.5	4.5	5	0	0	0	0	0.0
17993	7	2.5	S-M	5.5	4	5	4.5	4.5	0	0	0	0	0.0
18049	7.5	2.5	S-M	6	5	6	3	4.5	0	0	0	0	0.0
18365	5.5	3.5	M-S	6	3.5	5	6	4	0	0	0	0	0.0
18370	5	2.5	S-M	5	4.5	5	6.5	5	0	5	0	0	1.3
18768	6	4	M-S	6	6.5	5.5	6	5.5	5	0	0	0	1.3
18772	5	2	M	5.5	6.5	6.5	7	6	0	0	0	0	0.0
18808	6	3	M-S	5.5	5	4.5	7	4.5	0	0	5	5	2.5
D.R. Norland	5.5	2.5	M-S	4.5	5.5	4.5	6	5	0	5	0	5	2.5
R. Pontiac	6.5	2	S-M	6.5	4	6	5.5	3	10	0	5	10	6.3
RUSSET													
18142	6.5	5	M	4.5	6	5.5	7.5	5	0	0	0	0	0.0
18713	7	5	M-S	4	5	4.5	4	4	5	0	0	0	1.3
18714	7.5	5	M-L	6	4	5	6.5	5	0	0	10	0	2.5
Goldrush	5.5	6	L-M	3	5.5	5.5	7	5.5	0	0	5	0	1.3
R. Burbank	5.5	6	S	4.5	3	4.5	6	3	20	0	0	25	11.3
R. Norkotah	4.5	5	M-L	3.5	4	5.5	6	4	0	0	0	0	0.0
WHITES													
16478	6	5.5	M	4	5	4.5	4	4.5	0	0	50	0	12.5
16966	7.5	2	M-S	6.5	4	4.5	5	3.5	0	5	0	10	3.8
17662	5.5	3.5	M	5.5	4.5	6	6	4.5	0	0	5	15	5.0
Atlantic	7.5	2	L-M	5.5	5	5.5	6	5.5	25	15	15	60	28.8
Caesar	6.5	6	M-L	6	5	6	6.5	5	0	5	0	20	6.3
Itasca	5.5	4	L-M	3.5	5	4	6	4.5	0	0	0	0	0.0
Snowden	5.5	2	M-S	5	4.5	3.5	5	5	10	0	15	5	7.5

¹Location

Long Prairie, MN (119 days).
(Irrigated)

²Plant Growth

Vigor - 1 (poor) - 9 (vigorous)

³Tuber Characteristics

Shape - 1 (round) - 9 (long)
Set - 1 (poor) - 9 (excellent)
Shape Uniformity - 1 (poor) - 9 (excellent)
Size Uniformity - 1 (poor) - 9 (excellent)
Skin Maturity - 1 (poor) - 9 (excellent)
Appearance - 1 (poor) - 9 (excellent)

⁴% Tuber Quality (20 Tubers cut)

HH - Hollow Heart
IN - Internal Necrosis
VD - Vascular Discoloration
BC - Brown Center

Minnesota Table 9. Continued.

Clone	Cw/A		% of Total ⁵						Sp. Gr.	Comments
	US#1	Total	Small	Med	Large	Over	Culls	A's		
<u>REDS</u>										
17572	261.0	329.9	21	64	15	0	0	79.1	1.061	Tends to irr, pale color, lots small, pink
17578	387.9	424.1	8	47	38	7	1	91.5	1.065	Tends to deep eyes, good - ex. skin
17922	348.0	384.3	9	42	43	5	0	90.6	1.067	Attr++ lg, can skin, few grcr
17989	203.0	232.0	13	70	17	0	0	87.5	1.074	Some curves, smooth, g skn, long
17993	213.9	261.0	18	49	33	0	0	81.9	1.074	Oval, high set, B mkt but longish
18049	319.0	373.4	14	77	8	1	1	85.4	1.068	GrCr, too small, Lt skin
18365	304.5	358.9	15	79	6	0	0	84.8	1.064	Points, pr, grcr, dk red color, oval
18370	235.6	286.4	18	67	15	0	0	82.3	1.070	Tends to point, too small
18768	293.6	348.0	16	59	23	2	0	84.4	1.069	Long Red, pink color, oval
18772	235.6	293.6	19	54	26	0	1	80.2	1.064	Rnd, unif, smooth, attr, unif shape
18808	213.9	268.3	16	69	11	0	4	79.7	1.067	Small, great skin, oval?, some irr & grcr
D.R. Norland	275.5	319.0	13	59	26	1	1	86.4	1.062	Pale red to pink, too small, not unif
R. Pontiac	315.4	398.8	21	56	22	1	0	79.1	1.061	Rough, deep eyes, pale color, irr
<u>RUSSET</u>										
18142	239.3	290.0	9	66	16	0	9	82.5	1.073	Hvy rus, thick skin, Grcr in lg, long oval
18713	293.6	329.9	10	60	27	1	1	89.0	1.087	Long shape, twists, not attr here
18714	420.5	460.4	9	59	31	1	0	91.3	1.090	Nice blocky, smooth, oval
Goldrush	213.9	228.4	6	52	41	0	0	93.7	1.071	Few points, blocky, smooth, heavy skn
R. Burbank	203.0	257.4	18	72	7	0	3	78.9	1.086	Pts, pr, offshape, knobs
R. Norkotah	224.8	250.1	10	55	35	0	0	89.9	1.073	Can twist here, lt. Rus, some irr
<u>WHITES</u>										
16478	253.8	282.8	9	62	28	0	1	89.7	1.089	Lt russet, blocky shape
16966	322.6	369.8	11	75	13	0	2	87.3	1.089	Irr, deep eyes, pts, knobs, some rough
17662	282.8	322.6	11	64	22	1	1	87.6	1.076	GrCr, oval shape, pts, pr
Atlantic	319.0	362.5	12	46	36	6	0	88.0	1.093	Some GrCr, ok here
Caesar	337.1	358.9	6	68	26	0	0	93.9	1.082	V. long, curves & pts, g skn, smooth
Itasca	271.9	300.9	8	63	28	0	1	90.4	1.070	Irregular, some attr
Snowden	264.6	315.4	16	59	24	1	0	83.9	1.083	Too small, deep eyes, a lot here

¹LocationLong Prairie, MN (119 days).
(Irrigated)⁵Tuber SizeSmall - < 1 7/8
Med - 1 7/8 - 2 1/4
Large - 2 1/4 - 3 1/2
Over - > 3 1/2

Minnesota Table 10. Advanced Seedlings and Cultivars at Hollandale, Minnesota¹ in 1998.

Clone	Plant Growth ²		Tuber Characteristics ³							% Tuber Quality ⁴				Total Defects
	Vigor	Maturity	Shape	Size	Set	Shape Unif.	Size Unif.	Skin Maturity	App.	HH	IN	VD	BC	
REDS														
17572	3	1.5	2	M-S	3.5	3	4	5	4	0	0	10	0	2.5
17578	3	2	2.5	M-S	2.5	3.5	4	4.5	3.5	0	0	5	0	1.3
17922	2.25	3.5	2	M-S	4.5	5.5	5	4	5	0	0	0	0	0.0
17989	2.75	3.5	3.5	M-S	3	4.5	5	5.5	4.5	5	0	0	0	1.3
17993	3.75	2.25	2.5	M	6	5	5.5	6	5	0	0	0	0	0.0
18049	3	2.25	2.5	M	4.5	5.5	5.5	6.5	5.5	10	0	0	0	2.5
18365	3	1	2	M-S	3	4	4	6	4.5	0	0	10	0	2.5
18370	3	3	4	M	4	4	4	8	3	0	0	0	0	0.0
18768	3.5	3	4	M-L	5	3.5	3.5	3	3	0	0	5	0	1.3
18772	2	3	3	S	2	2	2	3	2	0	0	5	0	1.3
18808	1.75	2.25	2.5	M-S	2	3	4	4.5	3	0	0	5	0	1.3
D.R. Norland	2.75	1.5	3	M-S	3	3.5	3.5	4	3	0	0	0	0	0.0
NL D.R Norland	2.75	1.5	2.5	M	3	3	3.5	3.5	3.5	0	0	0	0	0.0
R. Pontiac	3.75	4	2.5	M-L	4.5	2.5	4	3	2.5	15	0	0	0	3.8
RUSSET														
16478	2.75	3.25	4	M-S	2.5	3.5	3.5	4	4	10	0	40	0	12.5
18142	3.5	3	5	L-M	4	6	6.5	6	6	5	0	15	0	5.0
18710	3.5	5	6	L	6	5	6	6	6	5	0	0	0	1.3
18713	4	3.75	5	M-S	4	6	6	6.5	5	20	0	10	0	7.5
Goldrush	3.25	2.75	6	M-L	5	6	6	6	5.5	10	0	25	0	8.8
R. Burbank	3.5	4	5.5	M-S	3.5	1.5	1.5	3	2	10	0	15	0	6.3
R. Norkotah	3.25	2.5	5.5	M-L	4	5	4	5	5	55	0	10	0	16.3
WHITES														
16966	3.75	4.5	3.5	M-S	4	3.5	3.5	4.5	4	5	0	20	0	6.3
17662	3.5	3.5	2.5	M	4	4.5	2.5	4	3.5	0	0	5	0	1.3
Atlantic	4.25	2.75	2.5	M	5.5	3	3.5	5	4	15	0	5	5	6.3
Caesar	3.75	4.75	5	L-M	6	4.5	4.5	4.5	4.5	5	0	0	0	1.3
Itasca	3.5	2.75	4	M	4	4.5	4.5	5.5	4.5	10	0	15	0	6.3
Snowden	4	3.25	2	M	4	4	4.5	6	4	10	0	5	0	3.8

¹Location

Hollandale, MN (103 days).
(Non-irrigated)

²Plant Growth

Vigor - 1 (poor) - 5 (vigorous)
Maturity - 1 (early) - 5 (late)

³Tuber Characteristics

Shape - 1 (round) - 9 (long)
Set - 1 (poor) - 9 (excellent)
Shape Uniformity - 1 (poor) - 9 (excellent)
Size Uniformity - 1 (poor) - 9 (excellent)
Skin Maturity - 1 (poor) - 9 (excellent)
Appearance - 1 (poor) - 9 (excellent)

⁴% Tuber Quality (20 Tubers cut)

HH - Hollow Heart
IN - Internal Necrosis
VD - Vascular Discoloration
BC - Brown Center

Minnesota Table 10. Continued.

Continued.

Clone	Cwt/A		% of Total ⁵						A's	Sp. Gr.	Comments
	US#1	Total	Small	Med	Large	Over	Culls				
REDS											
17572	166.8	213.9	22	64	14	0	0	78	1.059	Small, irr, pale color, some irr & knobs	
17578	116.0	137.8	16	71	13	0	0	84	1.066	Ok here, in H2O, small, oval	
17922	195.8	210.3	7	57	34	2	0	93	1.067	V. attr size and shape, skins	
17989	159.5	181.3	12	74	14	0	0	88	1.072	Good color, small, long here	
17993	206.6	232.0	11	81	8	0	0	89	1.072	Nice color, m size, V. attr, needs sz	
18049	203.0	217.5	7	60	33	0	0	93	1.066	V. attractive color, can skin, ex. Here	
18365	155.9	203.0	23	66	11	0	0	77	1.063	Small, pts, H2O, scurf, can get long	
18370	76.1	87.0	13	71	17	0	0	88	1.066	Cracking skin, pale color	
18768	199.4	235.6	15	72	12	0	0	85	1.067	Dull color, long	
18772	25.4	32.6	22	78	0	0	0	78	1.059	Skins	
18808	94.3	116.0	19	78	3	0	0	81	1.065	Ex color, maybe too small, some pts	
D.R. Norland	130.5	145.0	10	80	10	0	0	90	1.064	Scurf, poor color	
NL D.R Norland	155.9	181.3	14	68	18	0	0	86	1.065	Pale color, v. small	
R. Pontiac	232.0	253.8	6	60	31	0	3	91	1.068	Irr, skins, deep eyes, pale color, unif sz	
RUSSET											
16478	119.6	145.0	15	68	15	0	3	83	1.087	Small, irr, stolons attached, lt rus	
18142	145.0	163.1	11	62	27	0	0	89	1.069	Attr, smooth, excellent	
18710	155.9	166.8	7	72	22	0	0	93	1.078	V. attr, good size	
18713	137.8	166.8	17	59	24	0	0	83	1.083	V. small, smooth, some Grcr	
Goldrush	224.8	257.4	11	62	24	1	1	87	1.077	Smooth, attr	
R. Burbank	145.0	210.3	19	59	10	0	12	69	1.079	Irr, knobs, pr	
R. Norkotah	177.6	206.6	14	51	35	0	0	86	1.072	Attractive, smooth, good size	
WHITES											
16966	184.9	224.8	18	71	11	0	0	82	1.084	Points, irr	
17662	228.4	268.3	15	62	23	0	0	85	1.078	Gets big, better than Cascade	
Atlantic	188.5	221.1	15	69	15	2	0	85	1.093	Variable size, H2O, Drop	
Caesar	268.3	351.6	7	57	20	0	16	76	1.073	Variable, smooth, some pts, most attr.	
Itasca	242.9	261.0	7	61	32	0	0	93	1.074	Ok here, long here, gets big & blocky	
Snowden	203.0	213.9	5	66	29	0	0	95	1.089	Too small, deep ends, var size, drop	

¹Location⁵Tuber Size

Hollandale, MN (103 days).
(Non-irrigated)

Small - < 1 7/8
Med - 1 7/8 - 2 1/4
Large - 2 1/4 - 3 1/2
Over - > 3 1/2

Minnesota Table 11. Breeding Germplasm (Genetic Series) and Cultivars at Becker, Minnesota¹ in 1998.

Clone	Growth ² Tuber ³		% Tuber Quality ⁴					Flesh Color	Sp. Gr.	Comments
	Maturity	App.	HH	IN	VD	BC	Total Defects			
REDS										
15622	3	.	0	0	0	0	0.0	Yellow, bright	1.075	Pink, big, blocky
16832	3.5	.	0	0	0	10	2.5	White	1.075	Points, pairs, skins, long, pink
84078	1.5	.	0	0	0	0	0.0	White	1.077	Pink, long, points
85375	5	.	0	0	0	10	2.5	Purple, light	1.074	Stolons attached, deep red color
85885	2.5	1	0	0	0	20	5.0	Cream	1.061	Long, tends to point, bottle, pairs, pink
85887	1	.	0	40	0	0	10.0	White	1.063	Points, pairs
85888	2	.	0	0	0	0	0.0	White	1.059	Smooth, unif sz & shp, V. attractive, too pink
85889	1	.	0	0	0	0	0.0	White	1.067	Pink, poor skin
85895	1	.	0	0	0	0	0.0	White	1.058	Some irregular, deep eyes
86101	1	.	0	0	0	0	0.0	White	1.071	Rough, lumpy, deep eyes, pink, long
86105	1.5	.	0	0	0	0	0.0	White	1.064	Pink, too pink, oval
D.R. Norland	1	.	0	0	0	0	0.0	White	1.055	Attractive, round, too pink
R. Pontiac	1.5	.	0	20	0	20	10.0	White	1.058	Heat sprouts, deep eyes, rough
83545	1.5	.	0	20	0	0	5.0	White	1.062	Rough, irregular, knobs, off type
85517	3	.	0	0	20	10	7.5	White	1.066	All B's, specialty market, white flesh
85616	5	.	0	0	0	0	0.0	White, pur VR	1.090	Purple, 2nd growth
RUSSET										
85038	1	7	0	0	0	0	0.0	Yellow, light	1.066	V. smooth, attractive
R. Burbank	2	.	40	0	0	20	15.0	White	1.076	Rough, irregular, knobs, off type
WHITES										
16191	4.5	.	0	80	0	0	20.0	Yellow, light	1.075	Big, blocky, skins, yellow flesh
17664	2	.	0	0	0	0	0.0	White	1.080	Big, blocky, some 2nd growth
17716	3	.	0	0	0	0	0.0	Cream	1.080	Points, big, blocky
17793	3	.	0	0	0	0	0.0	Cream, yel ctr	1.074	Uniform size and shape, smooth, good set
82462	1	.	0	0	0	0	0.0	Yellow, light	1.065	Stolons stick, uniform size
83007	1	.	20	0	0	0	5.0	Cream	1.071	Blocky, can point, ok here
83039	1	.	0	0	0	0	0.0	Yellow, light	1.074	Rnd, uniform size & shape, smooth, need sz
83806	1.5	.	0	0	0	0	0.0	Yellow, light	1.065	Big, flat, some 2nd growth, pink eyes
84362	1	.	0	40	0	30	17.5	Yellow, light	1.071	Long, smooth, attractive, medium size
84364	1	.	0	0	0	0	0.0	Yellow, bright	1.069	Smooth, can point
84509	1	.	0	0	0	0	0.0	Yellow, light	1.061	Long, FF type, flat, oval, smooth
85434	4	.	0	20	0	0	5.0	Yellow, bright	1.083	Small, 2nd growth, heat sprouts, yellow flesh
85438	2	.	70	0	0	0	17.5	Yellow, bright	1.051	Smooth, attractive, heat sprouts, yellow flesh
85439	2.5	.	60	0	0	0	15.0	Yellow, bright	1.050	Smooth, attractive, heat sprouts, lots of rot
85452	1	6	20	0	0	20	10.0	Yellow, bright	1.068	Round, ok here
85477	4	.	0	0	0	0	0.0	Yellow, bright	1.059	Small, round, some rough
85481	4	.	10	0	0	20	7.5	Yellow, light	1.050	Big, blocky, stolons stick
85541	1	7	0	0	0	0	0.0	Cream	1.063	V. attractive, smooth, > Shepody
85554	3.5	.	0	0	0	10	2.5	White	1.077	Long, big, rough, irregular
85561	2	.	0	0	0	0	0.0	White	1.065	Unif size & shape, deeper eyes, pink eyes

¹ Location	² Plant Growth	⁴ % Tuber Quality (20 Tubers cut)
Late - Becker, MN (140 days), Irrigated.	Maturity - 1 (early) - 5 (late)	HH - Hollow Heart
		IN - Internal Necrosis
	³ Tuber Characteristics	VD - Vascular Discoloration
	Appearance - 1 (poor) - 9 (excellent)	BC - Brown Center

Minnesota Table 11. Continued.

Clone	Growth ² Tuber ³		% Tuber Quality ⁴					Flesh Color	Sp. Gr.	Comments
	Maturity	App.	HH	IN	VD	BC	Total Defects			
85567	1	5	0	0	0	0	0.0	White	1.061	Gets lumpy, GrCr, pink eyes, long
85654	5	.	10	0	0	10	5.0	Yellow, bright	1.089	Round, smooth, attr pink eyes, yel flesh
85673	4.5	.	0	0	0	0	0.0	Cream	1.096	Oval, smooth, attractive
85674	3.5	6	0	0	10	0	2.5	White	1.079	Round, uniform size and shape, attractive
85675	3	.	0	0	0	10	2.5	White	1.093	Big, blocky, 2nd growth, uniform size
85679	4.5	.	0	10	0	0	2.5	White	1.096	Smooth, attractive, medium size
85683	5	.	0	50	0	0	12.5	White	1.097	Oval, smooth, medium size
85684	4.5	.	0	0	0	0	0.0	Cream	1.081	Oval, smooth, uniform size and shape, small
85685	5	.	30	0	0	0	7.5	White	1.094	Rough, irregular, off type
85687	4	.	0	0	0	10	2.5	White	1.089	Irregular, points, dep eyes
85873	2.5	.	0	0	0	0	0.0	White	1.090	Long, bottle, rough, purple eyes
85874	2	.	0	20	0	0	5.0	White	1.091	Rough, irregular, deep eyes, pink eyes
85878	3	.	0	0	0	0	0.0	White	1.090	Round, deep eyes = R. Pontiac
85881	3	.	0	0	0	0	0.0	Cream	1.083	Irregular, lumpy, deep eyes, pink eyes
85883	2.5	.	0	0	0	0	0.0	Yellow, light	1.076	Lumpy, irregular, deep eyes, purple eyes
85884	3.5	.	0	0	0	0	0.0	White	1.065	Smooth, uniform size and shape
85905	4	5	0	0	0	50	12.5	Yellow, bright	1.098	Uniform size & shape, pink eyes, yellow flesh
85906	2.5	.	0	0	0	0	0.0	Yellow, bright	1.072	All B's, smooth, B-market, pur eyes, yel flesh
85912	1	.	0	0	0	0	0.0	Yellow, bright	1.082	Purple eyes, smooth, ok here
85953	3	.	0	0	0	20	5.0	Cream	1.075	Attr, smooth, blocky, uniform size & shape
85954	3.5	.	0	0	0	0	0.0	White	1.079	Oval, 2nd growth, stolons
85956	3.5	7	0	10	0	0	2.5	White	1.062	Long, uniform size & shape, smooth, V. attr
85958	4.5	.	0	0	0	0	0.0	White	1.091	Deep eyes, rough, stolons stick
85959	4	.	0	0	0	0	0.0	White	1.075	Big, blocky, deep eyes
85960	1.5	.	20	0	0	0	5.0	White	1.065	Smooth, some rough
85965	4	.	0	10	0	0	2.5	White	1.077	Not uniform
85969	3.5	.	0	10	0	10	5.0	Cream	1.069	Rough, irregular, deep eyes
85975	2	.	0	0	0	0	0.0	White	1.073	Rough, deep eyes, irregular, long
86103	1	.	0	0	0	0	0.0	Cream	1.084	Deep eyes, rough, irregular, good size
86109	3.5	.	0	0	0	0	0.0	Yellow, bright	1.085	Rough, round, yellow flesh
86112	3	.	0	10	0	0	2.5	Yellow, bright	1.088	Rough, deep eyes, stolons attachedff type
86113	3.5	.	0	0	0	0	0.0	Yellow, light	1.086	Lots here, small to medium, 2nd growth, oval
86115	3.5	.	0	0	0	0	0.0	Yellow, bright	1.085	Small, knobs, 2nd growth, oval
86116	4.5	.	0	0	0	0	0.0	Yellow, bright	1.095	Lots of stolons, 2nd growth
86118	4.5	.	0	0	10	0	2.5	Yellow, bright	1.095	Irregular size and shape, rough, yellow flesh
86119	4.5	.	0	0	0	0	0.0	Yellow, bright	1.093	Rough, deep eyes, off type
86125	2.5	.	0	0	0	10	2.5	White	1.076	Small, round, uniform size and shape
86129	2.5	.	0	0	0	0	0.0	Yellow, bright	1.087	Rough, irregular, 2nd growth
86131	1.5	.	0	0	0	0	0.0	Yellow, bright	1.082	Small, uniform
Atlantic	1	.	0	0	0	10	2.5	Cream	1.086	Big, blocky, large, uniform
Snowden	2	7	0	0	0	0	0.0	Cream	1.082	Big, attractive, varietal potential
83835	1.5	.	30	20	0	10	15.0	White	1.067	Big, blocky, rough, purple and white
83959	1.5	.	0	20	0	10	7.5	Cream	1.079	Red splash, rough, irregular, pink eyes
85549	1.5	.	0	0	0	0	0.0	White	1.072	Irregular, deep eyes

¹ Location	² Plant Growth	⁴ % Tuber Quality (20 Tubers cut)
Late - Becker, MN (140 days), Irrigated.	Maturity - 1 (early) - 5 (late)	HH - Hollow Heart IN - Internal Necrosis VD - Vascular Discoloration BC - Brown Center
	³ Tuber Characteristics Appearance - 1 (poor) - 9 (excellent)	

Minnesota Table 12. Breeding Germplasm (Genetic Series and Cultivars for Disease Resistance in Minnesota¹ in 1998.

Clone	Resistance ²					Tuber ³		Flesh Color	Sp. Gr.	Comments
	CPB % Def.	Aphids M.#/Plt	Scab Sev.	Scab Cover.	Late Blight	Type / Color				
15622	30	51.0	1	T	Susc.	LR	Yellow, bright	1.075	Pink, big, blocky	
16191	45	25.7	5	M	Susc.	W	Yellow, light	1.075	Big, blocky, skins, yellow flesh	
16832	60	154.0	4	L	Susc.	LR	White	1.075	Points, pairs, skins, long, pink	
17664	30	30.8	1	T	Susc.	W	White	1.080	Big, blocky, some 2nd growth	
17716	75	343.8	2	M	Susc.	W	Cream	1.080	Points, big, blocky	
17793	80	53.0	2	L	Susc.	W	Cream, yel ctr	1.074	Uniform sz & shp, smooth, good set	
82462						W	Yellow, light	1.065	Stolons stick, uniform size	
83007	95	103.5	2	L	Susc.	W	Cream	1.071	Blocky, can point, ok here	
83039	90	260.0	2	L	Susc.	W	Yellow, light	1.074	Round, unif sz & shp, smooth, need size	
83545	95	137.8	2	L	Susc.	LP	White	1.062	Rough, irregular, knobs, off type	
83806	95	298.3	3	T	Susc.	PK	Yellow, light	1.065	Big, flat, some 2nd growth, pink eyes	
83835	85	118.5	3	T	Susc.	PK	White	1.067	Big, blocky, rough, purple and white	
83959	70	250.3	3	M	Susc.	PK	Cream	1.079	Red splash, rough, irregular, pink eyes	
84078	40	116.3	2	L	Susc.	PK	White	1.077	Pink, long, points	
84362	45	345.3	2	M	Susc.	W	Yellow, light	1.071	Long, smooth, attractive, medium size	
84364	80	833.3	3	L	Susc.	W	Yellow, bright	1.069	Smooth, can point	
84451	2	287.3	1	H	Susc.	LP				
84509	60	838.8	1	T	Susc.	W	Yellow, light	1.061	Long, FF type, flat, oval, smooth	
84970						LP				
85038	50	376.5	2	T	Susc.	R	Yellow, light	1.066	V. smooth, attractive	
85356		151.3	2	M	Susc.	W				
85364	2		5	M	Susc.	W				
85375	20	534.8	5	L	Susc.	R	Purple, light	1.074	Stolons attached, deep red color	
85393	100	126.7	1	T	Susc.	RB				
85410	100	101.0	2	T	Susc.	W				
85426	100	117.5	2	T		PE				
85430	100	178.5	0	0	od Susc.	R				
85432	100	43.3	0	0	Susc.	RB				
85433	90	160.0	2	T	Susc.	W				
85434	40	1192.5	5	M	Susc.	W	Yellow, bright	1.083	Small, 2nd growth, heat spr, yel flesh	
85438	50	1325.0	4	L	Susc.	W	Yellow, bright	1.051	Smooth, attractive, heat spr, yel flesh	
85439	65	716.3	5	L	Susc.	W	Yellow, bright	1.050	Smooth, attractive, heat spr, lots of rot	
85452	85	432.5	5	T	Susc.	PE	Yellow, bright	1.068	Round, ok here	
85476			5	T	Susc.	W				
85477	95	206.3	3	H	Mod Res.	W	Yellow, bright	1.059	Small, round, some rough	
85481	90	82.0	2	M		W	Yellow, light	1.050	Big, blocky, stolons stick	
85510	100		5	T	Susc.	PE				
85517	80	1507.5	0	0	Susc.	P	White	1.066	All B's, specialty market, white flesh	
85541	10	406.3	0	0	Susc.	W	Cream	1.063	V. attractive, smooth, > Shepody	
85549		625.0	5	L	Susc.	LR	White	1.072	Irregular, deep eyes	
85554	40	365.0	4	T	Susc.	W	White	1.077	Long, big, rough, irregular	
85561	60	178.3	3	M	Susc.	RB	White	1.065	Unif sz & shp, deeper eyes, pink eyes	
85567	70	530.0	3	T	Susc.	RB	White	1.061	Gets lumpy, GrCr, pink eyes, long	
85579	75	25.8	4	M	Susc.	LP				
85616			1	L	Susc.	P	White, pur VR	1.090	Purple, 2nd growth	
85654	90	370.0	4	T	Susc.	PE	Yellow, bright	1.089	Round, smooth, attr pink eyes, yel flesh	
85673	50	223.8	3	L	Susc.	W	Cream	1.096	Oval, smooth, attractive	
85674	50	256.7	5	M	Susc.	W	White	1.079	Round, uniform size and shape, attr	
85675	50	445.0	2	L	Susc.	W	White	1.093	Big, blocky, 2nd growth, uniform size	
85679	10	270.5	4	T	Susc.	W	White	1.096	Smooth, attractive, medium size	
85683	10	145.0	5	T	Susc.	W	White	1.097	Oval, smooth, medium size	
85684	20	257.5	4	M	Susc.	W	Cream	1.081	Oval, smooth, unif size and shape, small	
85685	8	63.0	3	L	Susc.	W	White	1.094	Rough, irregular, off type	

¹Location

Rosemount, MN - CPB
 Rosemount, MN - Aphid
 Becker, MN - Scab

²Resistance

CPB - % Defoliation, (Rosemount, MN)
 Aphids - Mean #/5 leaves, (Rosemount, MN)
 Scab - Severity 1 (surface) - 5 (pitted), (Becker, MN)
 Scab - Coverage T (Trace) - H (Heavy), (Becker, MN)

Tuber Color³

LP - Long pink	P - Purple	PK - Pink	RB - Red blotch
LR - Long red	PE - Pink eyes	r - Russet	W - White

Minnesota Table 12. Continued.

Clone	Resistance ²					Tuber ³		Flesh Color	Sp. Gr.	Comments
	CPB % Def.	Aphids M. #/Plt	Scab Sev.	Scab Cover.	Late Blight	Type / Color				
85687	8	79.8	3	L	Susc.	W		White	1.089	Irregular, points, dep eyes
85697	20	107.3	2	H	Susc.	W				
85715	100	39.5	1	H	Susc.	W				
85873	90	75.8	5	L	Susc.	W		White	1.090	Long, bottle, rough, purple eyes
85874	80	120.8	4	H	Susc.	W		White	1.091	Rough, irregular, deep eyes, pink eyes
85878	60	40.3	4	M	Susc.	W		White	1.090	Round, deep eyes = R. Pontiac
85881	100	270.0	5	H	Susc.	W		Cream	1.083	Irregular, lumpy, deep eyes, pink eyes
85882	80	243.8	4	T	Susc.	W				
85883	70	632.5	5	M	Susc.	W		Yellow, light	1.076	Lumpy, irregular, deep eyes, purple eyes
85884	60	392.5	2	L	Susc.	W		White	1.065	Smooth, uniform size and shape
85885	90	857.5	5	L	Susc.	R		Cream	1.061	Long, tends to point, bottle, pairs, pink
85887	95	466.3	3	L	Susc.	R		White	1.063	Points, pairs
85888	80	220.3	5	L	Susc.	R		White	1.059	Smooth, unif size & shape, V. attr, pink
85889	70	275.0	5	L	Susc.	R		White	1.067	Pink, poor skin
85895	100	473.8	2	L	Susc.	R		White	1.058	Some irregular, deep eyes
85905	95	144.3	5	M	Susc.	PE		Yellow, bright	1.098	Unif size and shape, pink eyes, yel flesh
85906	90	1170.8	3	M	Susc.	PE		Yellow, bright	1.072	All B's, smooth, B-market, pur eye, yel fl
85911	100	342.5	2	T	Susc.	PE				
85912	65	513.8	5	L	Susc.	PE		Yellow, bright	1.082	Purple eyes, smooth, ok here
85917	90	222.5	1	T	Susc.	W				
85953	80	842.5	2	L	Susc.	W		Cream	1.075	Attr, smooth, blocky, uniform sz & shp
85954	90	582.5	5	M	Susc.	W		White	1.079	Oval, 2nd growth, stolons
85956	60	1800.0	3	M	Susc.	W		White	1.062	Long, unif size and shape, smooth, V. attr
85958	40	212.5	2	L	Susc.	W		White	1.091	Deep eyes, rough, stolons stick
85959	35	990.0	2	T	Susc.	W		White	1.075	Big, blocky, deep eyes
85960	60	271.0	2	T	Susc.	W		White	1.065	Smooth, some rough
85965	60	496.7	2	M	Susc.	W		White	1.077	Not uniform
85969	40	343.8	4	T	Susc.	W		Cream	1.069	Rough, irregular, deep eyes
85975	50	296.7	4	L	Susc.	W		White	1.073	Rough, deep eyes, irregular, long
86100						W				
86101	45	1262.5	5	M	Susc.	LR		White	1.071	Rough, lumpy, deep eyes, pink, long
86103	80	171.3	4	T	Susc.	LR		Cream	1.084	Deep eyes, rough, irregular, good size
86105	80	706.3	5	T	Susc.	RB		White	1.064	Pink, too pink, oval
86108	100	73.0	1	T	Susc.	LR				
86109	90	465.0	2	L	Susc.	W		Yellow, bright	1.085	Rough, round, yellow flesh
86112	50	1175.0	2	T	Susc.	W		Yellow, bright	1.088	Rough, deep eye stol attached, off type
86113	60	1900.0	5	T	Susc.	W		Yellow, light	1.086	Lots here, sm to med 2nd growth, oval
86115	50	1615.0	5	L	Susc.	W		Yellow, bright	1.085	Small, knobs, 2nd growth, oval
86116	70	992.5	5	M	Susc.	W		Yellow, bright	1.095	Lots of stolons, 2nd growth
86118	70	466.3	4	L	Susc.	W		Yellow, bright	1.095	Irr size & shape, rough, yellow flesh
86119	30	632.5	5	H	Susc.	W		Yellow, bright	1.093	Rough, deep eyes, off type
86125	80	1237.5	5	L	Susc.	W		White	1.076	Small, round, uniform size and shape
86128	90	857.5	4	T	Susc.	PE		Yellow, bright	1.087	Rough, irregular, 2nd growth
86129	30	352.5	3	T	Susc.	PE				
86130	70	791.3	5	L	Susc.	PE				
86131	80	618.8	5	T	Susc.	PE		Yellow, bright	1.082	Small, uniform
Atlantic			1	T		W		Cream	1.086	Big, blocky, large, uniform
D.R. Norland	95	246.7	2	L	Susc.	R		White	1.055	Attractive, round, too pink
Goldrush	80	883.3	2	T	Susc.	r				
Norchip	60	885.0	2	T	Susc.	W				
R. Burbank	85	159.3	4	T	Susc.	r		White	1.076	Rough, irregular, knobs, off type
R. Norkotah	70	2100.0	5	L	Susc.	r				
R. Pontiac	60	90.8	5	M	Susc.	R		White	1.058	Heat sprouts, deep eyes, rough
Snowden	65	1160.0	4	L	Susc.	W		Cream	1.082	Big, attractive, varietal potential

¹Location

Rosemount, MN - CPB
 Rosemount, MN - Aphid
 Becker, MN - Scab

²Resistance

CPB - % Defoliation, (Rosemount, MN)
 Aphids - Mean #/5 leaves, (Rosemount, MN)
 Scab - Severity 1 (surface) - 5 (pitted), (Becker, MN)
 Scab - Coverage T (Trace) - H (Heavy), (Becker, MN)

Tuber Color³

LP - Long pink P - Purple PK - Pink RB - Red blotch
 LR - Long red PE - Pink eyes r - Russet W - White

Minnesota Table 13. Intermediate Selections (40-Hill Series) and Cultivars
for Scab Resistance in Minnesota¹ in 1998.

Clone	Tuber Type	Resistance ²			
		Becker		Grand Rapids	
		Scab Sev.	Scab Cover.	Scab Sev.	Scab Cover.
19254	R	4	T	2	L
19255	R	5	T	1	L
D.R. Norland	R	2	T	2	L
19256	R	0	0	1	M
19267	R	1	T	4	H
19272	R	1	T	1	L
19280	W	2	M	2	M
19287	W	1	T	2	M
19288	W	2	T	3	M
19289	W	4	T	3	M
Norchip	W	4	T	1	L
19290	W	1	T	2	M
19298	R	5	L	5	H
19303	R	3	L	1	L
19305	W	3	L	3	L
19306	R	1	T	2	L
19315	W	5	H	5	H
19322	W	5	T	4	M
19326	W	4	T	2	M
19328	W	3	L	4	L
19329	R	3	M	3	H
R. Pontiac	R	5	M	4	H
19336	W	5	L	5	H
19343	W	4	M	4	M
19346	W	5	L	5	M
19350	W	4	T	5	M
19353	W	5	T	4	M
19354	W	5	T	3	M
19355	W	3	T	2	M
19372	W	1	T	3	L
Snowden	W	4	T	5	M
19382	W	4	T	3	M
19386	W	2	L	3	M
19387	W	4	M	4	M
19388	W	3	T	3	M
19390	W	4	L	2	M
19392	W	5	T	4	M

¹Location

Becker, MN
Grand Rapids, MN

²Resistance

Scab - Severity 1 (surface) - 5 (pitted), (Becker, MN)
Scab - Coverage T (Trace) - H (Heavy), (Becker, MN)

Minnesota Table 13. Continued.

Clone	Tuber Type	Resistance ²			
		Becker		Grand Rapids	
		Scab Sev.	Scab Cover.	Scab Sev.	Scab Cover.
19402	W	5	T	3	M
19418	W	5	H	5	H
Atlantic	W	5	L	3	H
19422	W	3	L	2	M
19425	R	1	T	1	L
19427	W	3	L	4	H
19440	r	4	T	1	L
19443	W	1	T	3	H
19452	r	4	L	2	H
19456	W	4	H	4	H
19460	W	5	M	4	M
19462	W	5	H	4	M
Goldrush	r	1	T	2	M
19470	W	1	L	4	H
19484	W	5	M	3	H
19485	r	2	T	2	M
19486	W	1	H	3	L
19487	W	1	M	4	H
19493	W	2	L	2	M
19494	W	2	T	3	M
19504	W	2	L	4	H
R. Norkotah	r	4	T	4	H
19506	W	3	L	4	H
19515	W	1	T	3	M
19516	W	1	T	2	M
19518	W	2	L	4	H
19519	W	5	L	4	H
19520	W	4	L	4	H
19523	R	1	M	4	M
19525	R	2	T	2	L
19527	R	1	L	1	L
19528	R	1	T	1	L
19531	W	4	L	3	H
19534	W	5	H	5	M
R. Burbank	r	2	L	3	M
19535	W	5	H	2	L
19539	W	5	H	2	M
19545	W	2	L	3	M
19551	W	5	T	3	H
19553	W	2	L	5	M

¹Location²Resistance

Becker, MN

Scab - Severity 1 (surface) - 5 (pitted), (Becker, MN)

Grand Rapids, MN

Scab - Coverage T (Trace) - H (Heavy), (Becker, MN)

Minnesota Table 14. Intermediate Selections (20-Hill Series) for Disease Resistance in Minnesota¹ in 1998.

Clone	Tuber	Pedigree		Resistance ²		
	Type	Female	Male	Scab Sev.	Scab Cover.	Late Bl.
001-96-1	LR	15620	85345	4	M	Susc.
001-96-2	LR	15620	85345	4	H	Susc.
003-96-1	W	15620	85541	3	M	Susc.
003-96-2	PE	15620	85541	4	H	Susc.
003-96-3	LR	15620	85541	5	H	Susc.
Snowden	W			5	M	Susc.
003-96-4	R	15620	85541	4	H	Susc.
006-96-1		15620	ND 1871-3	5	H	
006-96-2	LR	15620	ND 1871-3	3	M	Susc.
006-96-3	R	15620	ND 1871-3	4	H	Susc.
007-96-1	R	15620	ND 2050-1	4	H	Susc.
008-96-1	R	15620	ND 2225-1	4	H	Susc.
009-96-1	R	15620	ND 3574-5	4	H	Susc.
009-96-2	R	15620	ND 3574-5	4	H	Susc.
009-96-3	R	15620	ND 3574-5	2	M	Susc.
010-96-1	LR	15620	ND 3595-17	3	M	Susc.
010-96-2	R	15620	ND 3595-17	3	H	Susc.
010-96-3	LR	15620	ND 3595-17	4	H	Susc.
010-96-4	R	15560	ND 3595-17	4	H	Susc.
013-96-1	R	15622	ND 2050-1	4	H	Susc.
027-96-2	W	17251	82462	4	H	Susc.
028-96-1	R	17300	ND 2050-1	3	M	Mod-Res
034-96-1	LR	17335	ND 2050-1	3	M	Mod-Res
034-96-2	R	17335	ND 2050-1	3	M	Mod-Res
035-96-1	R	17335	ND 2225-1	3	H	Susc.
035-96-2	R	17335	ND 2225-1	4	M	Susc.
036-96-1		17335	ND 3574-5	3	M	
D.R. Norland	R			5	H	Susc.
039-96-1	R	17590	ND 2050-1	2	L	Mod-Res
039-96-3	R	17590	ND 2050-1	2	M	Susc.
040-96-2	R	17590	ND 3595-17	3	M	Mod-Res
040-96-3	R	17590	ND 3595-17	3	H	Susc.
040-96-4	R	17590	ND 3595-17	3	H	Susc.
040-96-5	R	17590	ND 3595-17	3	H	Susc.
040-96-6	R	17590	ND 3595-17	4	H	Susc.
040-96-8	R	17590	ND 3595-17	3	M	Susc.
041-96-1	W	17678	82462	5	M	Susc.
048-96-1	W	17742	NDA 2031-2	5	M	Susc.
Goldrush	r			2	M	Susc.
048-96-3	W	17742	NDA 2031-2	5	H	Susc.
049-96-1	R	ND 1871-3	17335	4	H	Susc.

¹Location

Grand Rapids, NM - Scab
Rosemount, MN - LB

²Resistance

Scab - Severity 1 (surface) - 5 (pitted)
Scab - Coverage T (Trace) - H (Heavy)

Minnesota Table 14. Continued.

Clone	Tuber	Pedigree		Resistance ²		
	Type	Female	Male	Scab Sev.	Scab Cover.	Late Bl.
049-96-2	R	ND 1871-3	17335	3	H	Susc.
049-96-4	R	ND 1871-3	17335	4	M	Susc.
051-96-1	RB	ND 1871-3	83335	3	M	Susc.
054-96-1	LR	ND 2050-1	85673	4	M	Susc.
054-96-2	LR	ND 2050-1	85673	4	H	Susc.
054-96-3	LR	ND 2050-1	85673	4	H	Susc.
058-96-3	R	ND 3574-5	85431	4	H	Susc.
059-96-1	R	ND 3595-17	17590	3	M	Susc.
064-96-1	W	83007	17742	4	H	Susc.
065-96-1	W	83545	85673	4	H	Susc.
065-96-4		83545	85673	4	H	
R. Norkotah	r			3	H	Susc.
072-96-2	R	84505	ND 2225-1	4	H	Susc.
072-96-3	R	84505	ND 2225-1	4	H	Susc.
073-96-1	LR	84505	ND 3574-5	3	M	Susc.
074-96-1		84505	ND 3595-17	3	M	
074-96-3	R	84505	ND 3595-17	3	M	Susc.
075-96-1	PE	84509	15620	4	M	Susc.
075-96-2	PE	84509	15620	4	H	Susc.
Norchip	W			2	M	Susc.
080-96-2	W	85355	17742	2	M	Mod-Res
080-96-4	W	85355	17742	3	M	Susc.
080-96-5	W	85355	17742	3	H	Susc.
080-96-6	W	85355	17742	2	M	Susc.
080-96-7	W	85355	17742	4	H	Susc.
080-96-8	W	85355	17742	3	M	Susc.
081-96-1	W	85364	85463	5	H	Susc.
086-96-1	PE	85549	16180	3	M	Susc.
088-96-1	LR	85549	17742	4	H	Susc.
088-96-2	W	85549	17742	5	H	Susc.
092-96-1	r	85718	85673	4	H	Susc.
Atlantic	W			5	H	Susc.
092-96-3	W	85718	85673	2	M	Susc.
093-96-1	W	75-2	85673	4	H	Susc.
096-96-1	R	Reddale	Desiree	5	H	Susc.
099-96-1	W	9480	15752	3	M	Susc.
099-96-2	PE	9480	15752	4	H	Susc.
099-96-3	W	9480	15752	4	H	Susc.
100-96-2	R	85513	ND 3574-5	2	H	Susc.
101-96-1	W	9480	85718	4	H	Susc.
101-96-2		9480	85718	5	H	

¹LocationGrand Rapids, NM - Scab
Rosemount, MN - LB²ResistanceScab - Severity 1 (surface) - 5 (pitted)
Scab - Coverage T (Trace) - H (Heavy)

Minnesota Table 14. Continued.

Clone	Tuber Type	Pedigree		Resistance ²		
		Female	Male	Scab Sev.	Scab Cover.	Late Bl.
102-96-1		9480	85719	5	M	
102-96-2	W	9480	85719	4	M	Susc.
102-96-3	W	9480	85719	4	M	Susc.
102-96-4	W	9480	85719	3	H	Susc.
102-96-5	W	9480	85719	4	H	Susc.
102-96-6	W	9480	85719	5	H	Susc.
102-96-7	W	9480	85719	4	H	Susc.
103-96-1	R	9480	85772	4	H	Susc.
103-96-2	PE	9480	85772	4	H	Susc.
R. Pontiac	R			5	H	Susc.
104-96-1		85504	85541	4	H	
105-96-1	W	85504	85546	4	H	Susc.
108-96-1	W	85549	85541	3	H	Susc.
108-96-2	W	85549	85541	4	H	Susc.
113-96-1	W	85551	85541	5	H	Susc.
113-96-2	PE	85551	85541	2	H	Susc.
120-96-1	W	85558	85541	4	H	Susc.
120-96-2	W	85558	85541	4	M	Susc.
120-96-3	W	85558	85541	4	H	Susc.
120-96-4	W	85558	85541	4	H	Susc.
127-96-1	R	15223	LA 1259	2	M	Susc.
129-96-1	W	85466	85485	4	M	Susc.
135-96-1	P	85617	84911	4	H	Susc.
209-96-1	PE	12966	ND 1618-13	1	L	Susc.
209-96-2	R	12966	ND 1618-13	3	H	Susc.
211-96-1	R	ND 2224-5	13451	4	H	Susc.
211-96-2	R	ND 2224-5	13451	5	H	Susc.
R. Burbank	r			2	L	Susc.

¹Location

Grand Rapids, NM - Scab

Rosemount, MN - LB

²Resistance

Scab - Severity 1 (surface) - 5 (pitted)

Scab - Coverage T (Trace) - H (Heavy)

Minnesota Table 15. Mean Performance of Advanced Seedlings (North Central Regional Trials) at Becker, Minnesota¹ in 1998.

Growth ²	Clone	Maturity	Type	App.	% Tuber Quality ⁴				Cwt/A				% of Total ⁵				Sp. Gr.	Comments
					HH	IN	VD	BC	US#1	Total	Small	Med	Large	Over	Culls	A's		
REDS																		
	D.R. Norland	1.0	R	4.0	5	0	1	1	391.5	415.1	4	37	49	8	1	94.3	1.053	Pale color, too pink, unif size and shape
	MN 17572	1.4	R	5.5	7	11	0	3	460.4	507.5	8	44	41	6	1	90.7	1.049	Pale red, most ok
	MN 17922	1.5	R	6.0	0	0	0	5	520.2	563.7	5	35	55	2	3	92.3	1.055	Ex color, uniform size and shape, skins
	ND 5084-3	2.3	R	6.8	0	9	0	5	632.6	674.3	5	20	52	23	1	93.8	1.054	Attr, skins, unif sz & shp, stolons attached
	R. Pontiac	1.8	R	2.8	2	1	0	6	587.3	670.6	5	21	50	17	8	87.6	1.059	Rough, deep eyes, lumpy, points here
RUSSET																		
	MSE 192-8	1.0	r	3.3	1	0	1	5	291.8	346.2	8	61	15	8	8	84.3	1.064	Small, uniform, too small
	ND 4093-4	1.0	r	4.8	0	0	0	0	364.3	393.3	6	71	19	3	1	92.6	1.064	Small size, smooth, attractive
	R. Burbank	2.0	r	1.8	17	9	0	3	407.8	547.4	5	40	17	18	21	74.5	1.076	Knobs, GrCr, bottle, 2nd growth
	R. Norkotah	1.0	r	6.0	0	0	0	7	502.1	525.6	3	46	41	8	2	95.5	1.065	Unif size and shape, good set, attractive
	W 1151	1.0	r	5.8	0	1	0	13	496.6	520.2	4	48	47	0	0	95.5	1.063	Attractive, unif size and shape, smooth
	W 1348	2.4	r	5.5	5	0	0	2	565.5	603.6	5	65	20	10	1	93.7	1.076	Gets long, points here, curves
WHITES																		
	Atlantic	2.1	W	4.8	11	24	14	3	351.6	402.4	8	25	42	20	5	87.4	1.074	Variable size, round, uniform shape
	FV 8957-10	1.3	W	3.8	25	10	5	2	295.4	357.1	8	29	48	6	9	82.7	1.067	Rough, irregular, uniform size
	MN 16478	1.3	W	5.8	0	6	0	1	561.9	583.6	3	39	52	6	1	96.3	1.083	Light rus, smooth, attr unif sz & shp
	MN 16966	2.6	W	4.8	1	30	0	0	715.9	772.1	6	43	45	5	2	92.7	1.074	Uniform size and shape, big get lumpy
	MSA 091-1	2.4	W	4.8	8	30	7	0	465.8	527.4	7	34	48	7	5	88.3	1.080	Flat, unif sz & shp, ok here, few points
	MSB 073-2	2.5	W	5.5	0	2	0	3	442.3	476.7	7	52	38	2	0	92.8	1.075	Attr, smooth, round, uniform size & shape
	MSE 230-6	2.0	W	5.3	0	2	1	7	442.3	509.3	11	60	27	0	2	86.8	1.076	Attractive, medium, oval
	ND 2470-27	1.9	W	6.0	4	4	3	0	367.9	391.5	5	31	44	19	1	94.0	1.062	Big, blocky, too big
	ND 2676-10	1.6	W	5.3	6	25	6	10	474.9	525.6	9	44	44	3	1	90.3	1.065	Uniform size and shape, medium
	Norchip	2.0	W	4.5	0	7	4	6	400.6	444.1	8	49	39	2	2	90.2	1.071	Unif sz & shp, smooth, medium to small
	Snowden	2.8	W	6.3	0	1	1	11	594.5	619.9	3	17	51	27	1	95.9	1.081	V.big, too big, end folds
	W 1313	2.4	W	4.8	1	3	1	12	478.5	534.7	8	44	42	3	3	89.5	1.088	Attr, medium to small, unif sz & shp, small
	W 1355-1	3.0	W	5.5	2	3	0	7	567.3	636.2	11	66	23	0	0	89.2	1.079	Uniform size and shape, high set
	Wis 75-30	1.8	W	5.5	0	1	0	0	674.3	717.8	6	52	38	4	1	93.9	1.076	Attr, smooth, uniform size and shape
Footnotes																		
¹ Location				³ Tuber Characteristics				⁴ % Tuber Quality (20 Tubers cut)				⁵ Tuber Size						
Late - Becker, MN (140 days).				Appr - 1 (poor) - 9 (excellent)				HH - Hollow Heart				Small - < 1 7/8						
(Irrigated)								IN - Internal Necrosis				Med - 1 7/8 - 2 1/4						
² Plant Growth								VD - Vascular Discoloration				Large - 2 1/4 - 3 1/2						
Maturity - 1 (early) - 5 (late)								BC - Brown Center				Over - > 3 1/2						

Nebraska Potato Variety Trials

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Introduction

In 1998, trials were conducted at Imperial, Kearney, O'Neill, and Scottsbluff. All entries were planted at Imperial and Scottsbluff, the latter also had four additional entries. White-skinned entries were planted at Kearney and the other entries at O'Neill. There were 12 white-skinned (14 in Scottsbluff), 21 russet (19 in O'Neill), 2 red (4 in Scottsbluff), and 1 yellow entries. Nebraska participated in the North Central Regional (NCR) trial having 25 entries. This trial was conducted at the Panhandle Research and Extension Center (PREC) in Scottsbluff; results can be found in the North Central Regional Trial report.

Materials, Methods and Conditions

Soils were sandy loams; pHs ranged from 5.9 to 7.8, and organic matter content was between 0.3 and 9.0%. The ranges of major fertilizers were 175-230 lb N/ac, 100-200 lb P₂O₅/ac, 0-400 lb K₂O/ac and 25-160 lb S/ac. Boron, calcium, copper and zinc were added at some sites. Seed pieces were cut, treated with TOPS MZ and stored for seven to 30 days at 55 F. Growers used their conventional practices. Insecticides were Thimet applied at planting and, depending on location, post-emergence applications of Asana (for psyllids and leafhoppers), Monitor and Provado (for green peach aphids, loopers and aster leafhoppers), Furadan (for sand chafer), and Pounce and Thiodan (both for false chinch bugs). Depending on location, Turbo (broad spectrum) was applied pre-emergence, Matrix (for triazine-resistant pigweed), and Poast (for grasses) were applied post-emergence. Blight treatments were Bravo Zn, Bravo + Penncozeb, Dithane, Curzate DF + Bravo, Manex C8 + Bravo, Quadris, SuperTin, and copper hydroxide at desiccation. Vines were desiccated with Diquat followed by vine beating in some cases.

The trial design was strip plots from which a section (10' @ Kearney, 20' @ O'Neill, 24' @ Imperial and Scottsbluff) was harvested. Trials were conducted

under center-pivot irrigation. The season was characterized as a cool May, cool and wet from the third week of July to the second week of August, and hot (record-breaking) September. Other deleterious conditions were: at Scottsbluff, there was a severe potato psyllid infestation; at O'Neill, plots showed poor weed control, and, at Imperial, irrigation was stopped in the first week of August.

Rainfall and relative humidity tended to be below normal except mid-July to mid-August and, in most locations at the end of May. Temperature was normal.

Yield data were taken on tubers under and over 1 7/8 inch diameter. Within two weeks after harvest, visual tuber defects were determined and so was specific gravity using a hydrometer. Fry color after curing was measured with an SFA/PC color chart.

Results and Discussion

YIELD (Table 2): The highest yields over three locations were white entries: ATX85404-8, AV77531-1, MSB076-2 and AC Brador; russet entries: A87-92-1, AC87-084-3, CO80011-5 (Crestone Russet), MSB106-7, TX1385-12, and TXAV657-27, and Yukon Gold.

SPECIFIC GRAVITY (Table 3): Most white entries had average specific gravities above 1.085. W1313 averaged the highest (1.097) as last year. Of the four higher-yielding white-skinned entries, only MSB076-2 had a high specific gravity (1.090). Among russet entries most had a specific gravity over 1.075 with AO82-611-7, CO85026-4, TXAV657-27 (a higher yielding entry), Ranger Russet, and Amisk having the highest (1.082). Other russet entries with 1.080 were A84-118-3, A86-102-6 and A87-92-1, also with a higher yield. Yukon Gold's gravity was 1.085.

COOKING COLOR (Table 3): Light colored chips (< 2) were produced from many white entries. A reading of 2 occurred with AC Brador, CalWhite and MN16180. NE8644 produced dark chips (reading of 3) at Scottsbluff. Russet entries that fried darker than Russet Burbank and Norkotah Russet (>3) were AC83-064-1, AC87-084-3 (a higher yielding entry), CO85026-4, and MSB106-7 (a higher yielding entry).

TUBER DEFECTS (Tables 4 and 5): Entries with tubers having the following defects were:

Off-Shape (>8% @ 2 sites):

- AC Brador and MN16180,
- Russet Burbank, A88-338-1, and MSB106-7

Common Scab (>5% @ Scottsbluff):

- CalWhite and MSB103-7 (a russet)

Black Scurf (>5% @ 2 sites):

- MSB076-2, Russet Burbank, A84-118-3, AC83-064-1, MSB106-7, and TXAV657-27.

Hollow Heart (5% at a location):

- A86-102-6, A87-92-1, W1313.

EARLY BLIGHT SUSCEPTIBILITY (Table 6):

AC Brador and AV77531-1 were the only white-skinned entries showing tolerance to early blight. Russet entries that showed a tolerance (<1 rating on 9/28) for early blight were Amisk, Ranger Russet, Russet Burbank, A82-360-7, A84-118-3, A86-102-6, A87-92-1, AC83-064-1, and TXAV657-27. Those entries showing the most susceptibility (>3 rating on 9/28) to early blight were MN16489 and NE8812 among whites, Russet Norkotah and MSB106-7 among russets, and all the reds. Note that the early blight readings were visual plot estimates.

MATURITY (Table 6): Relative maturity ratings were taken on 8/28 and 9/8 to observe early to medium maturing entries. Dard Red Norland, MN16489 (a white), NE8637 (a red) and NE8812 (a white) were the earliest maturing entries (>1 rating on 8/28). Early-medium maturing entries (>2 rating on 9/8) were Atlantic, Snowden and NE8644 among whites, regular Russet Norkotah, and, among reds, NE8664.

DESICCATION (Table 6): Leaf and stem desiccation readings were taken on 10/7, eight days after treatment with Diquat 2E @ 1 pt/a.

Entries showing slow desiccation were:

whites -- CalWhite, and possibly AV77531-1 and NDO1496-1;
russets -- A84-118-3, A87-92-1, AC83-064-6, AC87-084-3, and AO82-611-7, and, possibly, Amisk, Ranger Russet, Russet Burbank, A82-360-7, A88-338-1, AC83-064-1, and TXAV657-27.

VIGOR (Table 7): Relative early vigor ratings were taken at Imperial on 5/27, approximately 10 days after emergence. Rating was based on a combination of stand, uniformity, vine size, and general healthy appearance. At Scottsbluff, relative vine size was visually estimated at several dates.

Nebraska Table 1. Key dates for each trial in 1998.

	IM	KE	ON	SB
P	4/16	4/24	5/6	5/16
D	8/31	9/16	9/28	9/28
H	9/10	9/29	9/29	10/5
days:				
P to D	136	145	145	135
IM=Imperial,KE=Kearney,ON=O'Neill,SB=Scottsbluff				
P=planting,D=desiccation,H=harvest.				

Nebraska Table 2. Yields at Imperial (IMP), Kearney or O'Neill (K/O) and Scottsbluff (SBF).

Entries	Total Yield, cwt/ac				Yield of >1.8" Tubers			
	IMP	K/O	SBF	ave.	IMP	K/O	SBF	ave.
<i>white-skinned:</i>								
Atlantic	308	541	.	425	254	515	133	301
Brador	514	686	.	600	472	660	266	466
CalWhite	236	693	.	465	218	673	157	349
Snowden	278	356	.	317	236	343	145	241
ATX85404-8	335	654	.	495	293	647	181	374
AV77531-1	414	614	.	514	399	581	157	379
MN16180	260	608	.	434	218	568	133	306
MN16489	338	376	.	357	284	350	206	280
MSB076-2	290	481	.	386	254	455	423	377
NDO1496-1	248	555	.	402	206	548	339	364
NE8644	.	.	.	.	.	.	85	.
NE8812	.	.	.	.	.	.	133	.
W1242	169	475	.	322	151	449	157	252
W1313	303	594	.	448	242	568	157	322
<i>russet-skinned:</i>								
Amisk	261	.	.	.	188	.	278	.
Ranger Russet	236	219	.	228	200	197	266	221
Rus. Burbank	245	321	.	283	212	299	85	199
Rus. Norkotah	378	.	.	.	330	.	182	.
Rus. Norkotah #8	308	256	.	282	266	230	182	226
Rus. Norkotah #112	281	292	.	287	248	248	121	206
Rus. Norkotah #223	263	380	.	322	206	329	85	207
A82-360-7	242	351	.	297	175	307	145	209
A84-118-3	236	263	.	250	194	241	194	210
A86-102-6	205	496	.	351	169	445	230	281
A87-92-1	256	533	.	395	236	518	194	316
A88-338-1	212	442	.	327	200	431	206	279
AC83-064-1	285	431	.	358	224	380	121	242
AC83-064-6	175	328	.	252	151	299	121	190
AC87-084-3	293	690	.	491	254	650	158	354
AO82-611-7	361	412	.	386	272	383	109	255
CO80011-5	224	475	.	350	182	453	254	296
CO85026-4	335	256	.	296	284	219	97	200
MSB106-7	448	401	.	425	424	372	444	413
TX1385-12	441	504	.	473	411	467	169	349
TXAV657-27	399	456	.	429	375	427	290	364
<i>red-skinned:</i>								
Dark Red Norland	335	146	.	241	278	131	254	221
CO86218-2	303	244	.	274	227	204	85	172
NE8637	.	.	.	.	.	.	85	.
NE8664	.	.	.	.	.	.	194	.
<i>yellow-fleshed:</i>								
Yukon Gold	397	354	.	376	383	339	290	337
site means:	300	553 ^K	.	430 ^{whites}	259	530 ^K	188	334 ^{white}
		357 ^O	.	335 ^{rest}		344 ^O		261 ^{rest}

IMP = Imperial (12 white, 21 russet, 2 red and 1 yellow entries = 36)

K^K/O^O = Kearney (12 white entries), and O'Neill (19 russet, 2 red, and 1 yellow entries = 22)

SBF = Scottsbluff (14 white, 21 russet, 4 red and 1 yellow entries = 40)

Nebraska Table 3. Specific gravity and fry color at Imperial (IMP), Kearney or O'Neill (K/O) and Scottsbluff (SBF).

Entries	Specific Gravity, (10 ⁻³)+1				Chip Color Chart			
	IMP	K/O	SBF	ave.	IMP	K/O	SBF	ave.
<i>white-skinned:</i>								
Atlantic	95	90	95	93	1	1	1	1
Brador	85	85	85	85	2	2	2	2
CalWhite	80	90	85	85	2	2	2	2
Snowden	90	95	90	92	1	1	1	1
ATX85404-8	85	85	80	83	2	2	1	1.7
AV77531-1	85	95	80	87	2	1	2	1.7
MN16180	85	75	80	80	2	3	1	2
MN16489	85	85	85	85	1	1	2	1.3
MSB076-2	90	90	90	90	1	1	1	1
NDO1496-1	85	95	80	87	1	1	2	1.3
NE8644	.	.	.	.	.	.	3	.
NE8812	.	.	80	.	.	.	1	.
W1242	90	95	95	93	1	1.5	1	1.2
W1313	100	105	85	97	1	1	1	1
<i>russet-skinned:</i>								
Amisk	80	.	85	82	3	.	2	2.5
Ranger Russet	85	85	75	82	2	2	2	2
Rus. Burbank	75	70	.	72	3	2	4	3
Rus. Norkotah	75	.	80	77	3	.	3	3
Rus. Norkotah #8	75	80	75	77	2	3	4	3
Rus. Norkotah #112	75	75	70	73	2	3	3	2.7
Rus. Norkotah #223	75	80	.	77	2	4	3	3
A82-360-7	75	75	70	73	1	3	2	2
A84-118-3	75	80	85	80	2	2	2	2
A86-102-6	75	80	85	80	3	3	3	3
A87-92-1	80	80	80	80	2	3	2	2.7
A88-338-1	70	75	80	75	3	3	3	3
AC83-064-1	70	70	70	70	3	4	3	3.3
AC83-064-6	70	70	70	70	3	3	2	2.7
AC87-084-3	75	90	70	78	3	4	3	3.3
AO82-611-7	80	90	75	82	2	3	3	2.7
CO80011-5	70	70	70	70	2	3	3	2.7
CO85026-4	85	80	.	82	3	4	3	3.3
MSB106-7	75	75	80	77	4	4	3	3.7
TX1385-12	75	70	75	73	2	5	2	3
TXAV657-27	80	80	85	82	1	3	2	2
<i>red-skinned:</i>								
Dark Red Norland	70	70	65	68	4	4	3	3.7
CO86218-2	75	70	.	72	3	4	3	3.3
NE8637	.	.	.	.	.	.	5	.
NE8664	.	.	70	.	.	.	2	.
<i>yellow-fleshed:</i>								
Yukon Gold	85	85	85	85	2	3	3	2.7
site means:								
	1.088 ^w	1.090 ^w	1.085 ^w	1.088 ^w	1.4 ^w	1.5 ^w	1.5 ^w	1.5 ^w
	1.076 ^R	1.078 ^R	1.077 ^R	1.077 ^R	2.4 ^R	3.2 ^R	2.7 ^R	2.8 ^R

^w white-skinned averages, ^Rrusset-skinned average

SFA/PC Color Chart: 1 = lightest (>65 on Agtron) to 5 = darkest (25-34 on Agtron).

Any entry with chip rating > 2 may be unacceptable for chips and > 3 may be unacceptable for French fries.

Nebraska Table 4. Tuber off-shape and hollow heart at Imperial (IMP), Kearney / O'Neill (K/O) and Scottsbluff (SBF).

Entries	Off-Shape			Hollow Heart		
	IMP	K/O	SBF	IMP	K/O	SBF
<i>white-skinned:</i>						
Atlantic	0	0	6	0	1	0
Brador	3	14	32	0	0	0
CalWhite	4	10	8	0	1	0
Snowden	1	4	4	0	0	0
ATX85404-8	0	0	10	0	0	0
AV77531-1	0	5	14	0	0	0
MN16180	7	8	22	0	0	0
MN16489 ¹	5	3	3	0	0	0
MSB076-2	2	3	6	1	1	0
NDO1496-1	0	0	1	0	0	0
NE8644	.	.	1	.	.	0
NE8812	.	.	4	.	.	0
W1242	5	1	2	0	2	0
W1313	3	1	1	0	5	0
<i>russet-skinned:</i>						
Amisk	1	.	10	0	.	0
Ranger Russet	5	1	24	0	0	0
Rus. Burbank	7	21	10	0	0	0
Rus. Norkotah	0	.	13	0	.	0
Rus. Norkotah #8	3	2	15	0	1	0
Rus. Norkotah #112	2	6	3	0	0	0
Rus. Norkotah #223	7	2	26	0	0	0
A82-360-7	3	12	0	0	0	0
A84-118-3	1	3	0	0	1	0
A86-102-6	10	6	2	0	5	0
A87-92-1	1	26	6	0	7	0
A88-338-1	35	7	8	0	3	0
AC83-064-1	4	5	14	0	0	0
AC83-064-6	0	3	6	0	0	0
AC87-084-3	3	4	0	0	2	0
AO82-611-7	1	0	12	0	0	0
CO80011-5	2	1	12 ³	0	0	0
CO85026-4	1 ²	1	8	0	0	0
MSB106-7	10	1	10	0	0	0
TX1385-12	2	12	5	0	3	0
TXAV657-27	3	2	1	0	0	0
<i>red-skinned:</i>						
Dark Red Norland	1	3	3	0	0	0
CO86218-2 ⁴	1	2	2	0	0	0
NE8637	.	.	0	.	.	0
NE8664	.	.	8	.	.	0
<i>yellow-fleshed:</i>						
Yukon Gold	2	1	8	0	1	0
site means:	4	5	8	<1	1	0

¹ light pink skin, ² 5% jelly ends, ³ growth cracks, ⁴ dark red (purple) skin

Nebraska Table 5. Common scab and black scurf at Imperial (IMP), Kearney or O'Neill (K/O) and Scottsbluff (SBF).

<u>Entries</u>	<u>Common Scab</u>			<u>Black Scurf</u>		
	<u>IMP</u>	<u>K/O</u>	<u>SBF</u>	<u>IMP</u>	<u>K/O</u>	<u>SBF</u>
<i>white-skinned:</i>						
Atlantic	7	0	4	1	1	0
Brador	0	0	0	0	0	11
CalWhite	0	0	14	0	14	0
Snowden	0	0	3	3	0	0
ATX85404-8	0	0	5	0	14	0
AV77531-1	0	1	3	0	7	0
MN16180	0	0	0	3	9	0
MN16489	0	0	0	0	2	0
MSB076-2	0	0	2	37	7	0
N0DO1496-1	0	0	2	3	0	11
NE8644	.	.	0	.	.	0
NE8812	.	.	0	.	.	0
W1242	0	0	3	0	3	0
W1313	0	0	0	5	1	4
<i>russet-skinned:</i>						
Amisk	0	.	0	3	.	0
Ranger Russet	0	1	0	3	5	0
Rus. Burbank	0	3	0	12	22	15
Rus. Norkotah	0	.	0	9	.	0
Rus. Norkotah #8	0	3	0	7	1	0
Rus. Norkotah #112	0	0	0	6	0	0
Rus. Norkotah #223	0	0	0	0	3	0
A82-360-7	0	0	0	0	0	0
A84-118-3	0	0	0	6	21	0
A86-102-6	0	0	0	3	0	0
A87-92-1	0	0	0	0	0	0
A88-338-1	0	0	0	0	0	0
AC83-064-1	0	0	0	7	10	0
AC83-064-6	0	0	0	3	6	0
AC87-084-3	0	0	0	0	0	0
AO82-611-7	0	0	0	1	0	0
CO80011-5	0	0	0	11	3	0
CO85026-4	0	0	0	0	0	0
MSB106-7	0	0	14	7	5	0
TX1385-12	0	0	0	3	4	0
TXAV657-27	0	3	0	9	12	7
<i>red-skinned:</i>						
Dark Red Norland	3	0	0	2	2	0
CO86218-2	0	3	0	0	0	0
NE8637	.	.	0	.	.	0
NE8664	.	.	4	.	.	0
<i>yellow-fleshed:</i>						
Yukon Gold	0	2	3	6	0	0
site means:	<1	<1	1	4	4	1

Nebraska Table 7. Vine growth observations.

Entries	Early Vigor		Vine Size
	0(no emergence)->		
	9(full vigor)		
	Imperial	Scottsbluff	
<i>white-skinned:</i>			
Atlantic	2		medium
Brador	2		medium
CalWhite	8		large
Snowden	7		medium
ATX85404-8	8		large
AV77531-1	4		very large
MN16180	3		medium
MN16489	6		very small
MSB076-2	5 (variable)		medium
NDO1496-1	7		medium
NE8644	.		small
NE8812	.		very small
W1242	7		medium
W1313	6		large
<i>russet-skinned:</i>			
Amisk	8		large
Ranger Rus.	8		medium
Rus. Burbank	7		very large
Rus. Norkotah	7		small
Rus. Norkotah 8	7 (variable)		small
Rus. Norkotah 112	6 (slightly variable)		medium
Rus. Norkotah 223	8		medium
A82-360-7	5 (small, uniform)		very large
A84-118-3	4		large
A86-102-6	8		medium
A87-92-1	8		large
A88-338-1	4 (variable)		very large
AC83-064-1	5		very large
AC83-064-6	5		medium
AC87-084-3	7		large
AO82-611-7 ¹	7		medium
CO80011-5 ²	3 (small)		small
CO85026-4	5		medium
MSB106-7	6		small
TX1385-12	8		medium
TXAV657-27	4		medium
<i>red-skinned:</i>			
Dark Red Norland	5		very small
CO86218-2	2		medium
NE8637	.		very small
NE8664	.		small
<i>yellow-fleshed:</i>			
Yukon Gold	5		medium

Early vigor ratings are based on a combination of stand, vine size and appearance and were taken only at Imperial on 5/27 about 10 days after emergence. Vine size ratings are visually based on canopy height and breadth; they were taken only at Scottsbluff in August.

Nebraska Table 6. Maturity, early blight and desiccation ratings at Scottsbluff (40 entries).

Entries	Maturity Rating		Early Blight Rating		Desiccation (%)	
	0(no dying)->5(dead)		0(none)->5(all)		0->100% (dead)	
	8/28	9/8	9/18	9/28	leaf	stem
<i>white-skinned:</i>						
Atlantic	1	2.5	1	3	90	30
Brador	0	0	0	0	80	20
CalWhite	0	0.5	0	1	10	0
Snowden	1	2.5	1	3	90	30
ATX85404-8	0	0	0	1	70	20
AV77531-1	0 ¹	0	0	0	70	10
MN16180	0	0	0	1	80	20
MN16489	2	3	3	4	90	60
MSB076-2	0	0.5	1	3	90	60
NDO1496-1	0	0	0	0.5	40	10
NE8644	1	2.5	2	2.5	90	60
NE8812	2	3	3	4	80	60
W1242	0.5	1	2	3	90	60
W1313	0.5 ¹	1	0.5	1	70	30
<i>russet-skinned:</i>						
Amisk	0	0	0	0	30	10
Ranger Rus.	0	0	0	0	40	10
Rus. Burbank	0 ¹	0	0	0.5	60	10
Rus. Norkotah	1	3	3	4	70	50
Rus. Norkotah 8	0	1.5	1.5	2	80	30
Rus. Norkotah 112	0.5	2	2	3	80	30
Rus. Norkotah 223	0	2	1	2.5	60	20
A82-360-7	0 ¹	0 ³	0	0	30	10
A84-118-3	0	0	0	0.5	30	0
A86-102-6	0	0	0	0	60	30
A87-92-1	0 ¹	0	0	0	20	0
A88-338-1	0	1	0.5	1	30	10
AC83-064-1	0 ¹	0	0	0	30	10
AC83-064-6	0	0	0.5	2	40	0
AC87-084-3	0	0.5	0	1	60	0
AO82-611-7	0	1	0.5	1	10	0
CO80011-5	0	2	2	2.5	70	50
CO85026-4	0	0	0	2	60	30
MSB106-7	0.5	2	3	4	60	40
TX1385-12	1	1.5	0	1	60	30
TXAV657-27	0	0	0	0.5	40	10
<i>red-skinned:</i>						
Dark Red Norland	4	4.5	4	4.5	60	50
CO86218-2	0.5	2	3	3.5	70	30
NE8637	2.5	4	4	5	90	80
NE8664	1	3	3	4	90	70
<i>yellow-fleshed:</i>						
Yukon Gold	0.5	2	0.5	1	60	30

Last and seventh blight treatment (Curzate DF + Bravo 500) was applied on 9/8.

The first signs of early blight appeared on entries on 9/18.

Vines were desiccated with Diquat 2E @ 1 pt/a on 9/28. Leaf and stem readings were taken on 10/7, 9 days later.

¹ flowering

New Jersey

Melvin R. Henninger

Trials were conducted at the Rutgers Agricultural Research and Extension Center in Upper Deerfield Township and the Snyder Research and Extension Farm near Pittstown. All plots were 21' long and 3' wide. Seed pieces were spaced at 9" for round types and 12" for long types. At both sites, Dual and Sencor were applied shortly after planting and additional Dual and Lexone after hilling.

At the Rutgers Agricultural Research and Extension location, 50 lb/A of the nitrogen and all of the P_2O_5 and K_2O were applied before planting and disked in. An additional 100 lb/A of nitrogen was top-dressed 5 weeks after planting to bring the total up to 150 lb N/A. The Upper Deerfield plots were harvested with a single-row mounted commercial harvester modified for bagging. No attempt was made to recover any lost tubers caused by normal harvester operation. All plots were sized with a spool sizer and specific gravities were determined by weight in air and water. Chip color evaluations were done by Mr. Steve Molnar of Wise Foods five days after harvest.

At the Snyder Research and Extension Farm 1000 lb/A of 15-15-15 was broadcast and disked in before planting. The Snyder Farm plots were harvested with a single-row commercial potato digger and picked up by hand. Round types were sized with a spool sizer, the long types were sized by weight, and specific gravities were determined by weight in air and water.

In 1998, planting was early and growing conditions were cool early, hot and dry after July 1st. Rainfall was supplemented by

many irrigations. At the Snyder Farm located in northwestern New Jersey, conditions were similar with very good growth. Ozone levels were high in early July and some varieties were damaged. Insects and diseases were not a limiting factor to growth.

To simplify the above information, trade names of some products are used. No endorsement is intended, nor is criticism implied of similar products not named. Both farm supervisors, Bill Pompper at Upper Deerfield and Ed Dager at the Snyder Farm, were very instrumental in maintaining excellent insect and disease control as well as keeping a good irrigation schedule to maintain good growth all season.

New Jersey Table 1. Yields, Specific Gravities, and Tuber Sizes for 24 Round White Potato Varieties, Harvested Main Season and Grown on a Sandy Loam Soil at the Rutgers Agricultural Res. & Ext. Center - Upper Deerfield, NJ - 1998.

Variety Name	Seed Source (1)	Total Yield		Spec. Grav.	% O v e r			Culls	% Tuber Sizes (2)				
		cwt/a	Market Yield cwt/a		1	7/8	2 ½		1	2	3	4	5
NY 112	ny	532	484	1.078	91	32		1	9	60	25	6	0
Kennebec	ne	537	483	1.068	95	48		5	5	47	36	11	0
NY R17- 7	ny	537	479	1.061	91	36		2	9	55	32	4	0
AF1615- 1	ne	518	477	1.071	94	39		2	6	55	36	3	0
NY R17-106	ny	547	468	1.065	87	21		2	13	66	19	2	0
NY R41- 11	ny	519	467	1.061	90	30		0	10	60	23	7	0
Katahdin	ne	495	463	1.062	94	41		1	6	54	36	5	0
Atlantic	ne	503	458	1.075	92	40		2	8	53	31	9	0
AF1437- 1	ne	543	456	1.051	94	42		11	6	53	36	5	0
NY 120	ny	467	442	1.084	96	42		1	4	53	37	5	0
AF 875-15	me	466	425	1.074	93	30		2	7	63	25	5	0
B0766- 3	ne	450	420	1.071	96	53		2	4	43	45	8	0
AF1569- 2	me	453	408	1.059	92	43		2	8	48	32	12	0
B0564- 8	ne	445	395	1.070	89	34		1	11	56	29	5	0
AF1857- 2	me	432	383	1.073	91	24		2	9	67	21	3	0
Niska	ne	421	381	1.069	93	33		2	7	60	26	7	0
Itasca	ne	437	366	1.066	87	26		7	13	61	23	3	0
Andover	ct	389	354	1.072	93	22		2	7	71	19	3	0
NY 119	ny	390	353	1.078	91	37		1	9	55	30	7	0
NY 110	ny	383	347	1.072	91	24		1	9	67	22	2	0
NY 103	ne	359	334	1.062	97	61		4	3	36	43	18	0
Yukon Gold	ne	343	322	1.069	94	48		1	6	47	40	8	0
NY 115	ny	362	320	1.070	88	28		0	12	61	26	1	0
Superior	ne	345	317	1.067	92	23		1	8	70	21	1	0
CV (3)		14	16	.31	3	23							
W-D Bayes LSD.05		94	100	.004	4	11		2	4	10	10	6	ns

(1) ct = Certified Seed, me = Univ. of Maine, ne = NE Regional Project, ny = Cornell University.
 (2) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 ½, S3= 2 ½ to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.
 (3) CV=Coef of Variation; W-D Bayes LSD.05=Waller Duncan Test For Least Significant Difference.

New Jersey Table 2. Plant and Tuber Characteristics, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings in New Jersey Table 1 (1).

Variety	PLANT			TUBER CHARACTERS							TUBER DEFECTS (2)							OVER		
	P	A	M	S	C	T	S	D	T	S	G	H	S	H	H	N	R	CC	ALL	Comments
NY 112	7	8	8	3	7	5	3	7	7	9	8	9	9	6	0	31	5	6	no	hn y+ SG+ ch-
Kennebec	7	7	7	2	8	8	5	5	5	7	8	9	9	1	0	6	7		std	bad scab
NY R17- 7	6	7	6	6	8	6	3	6	7	8	8	8	3	0	0	6	7	4	yes	y+ SG-- ch+
AF1615- 1	7	8	7	2	8	9	2	3	5	6	8	9	5	0	0	8	7	4	ok+	y+ hn ch+
NY R17-106	7	7	6	6	7	6	3	6	6	8	9	9	6	0	0				yes	y+ SG- s?
NY R41- 11	7	7	6	6	8	6	2	8	8	9	9	9	6	0	0	5	7	3	yes	y++ SG-- s? ch+
Katahdin	8	8	8	3	8	8	3	5	7	9	9	9	9	2	9	17	6		std	bad scab
Atlantic	7	7	6	4	7	5	2	8	7	8	5	9	3	1	37	5		5	std	hn lbc
AF1437- 1	6	7	3	6	7	5	2	7	6	8	3	7	1	0	0			7	no	y+ SG- gc ch-
NY 120	5	6	7	5	6	5	2	7	7	9	9	9	8	0	0	2	7	3	yes	s- y+ ch+
AF 875-15	5	6	5	6	8	7	2	6	6	9	9	9	5	1	1	18		4	yes	some scab ch+
B0766- 3	7	6	6	5	7	6	2	8	7	7	8	8	8	0	4	8		2	yes	sb+ ch+
AF1569- 2	6	7	6	8	7	6	3	7	7	8	7	9	1	0	13	6		4	no	bad scab hn ch+
B0564- 8	5	7	4	9	7	6	2	8	8	9	9	9	8	0	1	8		3	ok+	y? s? ch+ sb+
AF1857- 2	6	6	5	3	7	7	3	7	6	8	6	9	2	0	4	7		1	ok	bad scab y+ ch++
Niska	6	6	5	6	8	7	4	6	6	8	7	9	5	0	10	6		3	no	hn ch+ SG-
Itasca	5	3	7	5	7	8	5	6	3	5	7	9	8	0	2	8			no	app- sb+
Andover	5	5	2	7	7	6	3	6	7	8	8	9	5	3	0				ok	s-- y-- SG+
NY 119	6	6	5	8	7	5	2	6	7	6	9	6	5	0	38	4			no	hn y+ SG+
NY 110	6	6	7	6	8	7	2	6	7	9	9	9	3	0	0				yes	nice app
NY 103	4	5	5	7	8	8	3	7	6	7	9	9	3	1	6	7			ok+	bright skin hn
Yukon Gold	5	5	4	7	8	8	2	6	7	9	9	9	4	0	20	6			no	sb- hn
NY 115	6	7	6	3	8	8	3	6	6	9	9	9	4	0	11	6			ok	y? s?
Superior	3	6	3	8	7	5	4	6	7	7	9	9	7	0	6	6			std	some scab

(1) See New Jersey Rating Table on back cover for abbreviations and ratings for plant and tuber characteristics, tubers defects, chip color and comments.

(2) HH = No. of Hollow Heart tubers out of 40. HN = No. of Heat Necrosis tubers out of 40 cut.

New Jersey Table 3. Yields, Specific Gravities, and Tuber Sizes for 24 Round White Potato Varieties, Harvested Main Season and Grown on a Sandy Loam Soil at the Rutgers Agricultural Res. & Ext. Center - Upper Deerfield, NJ - 1998.

Variety Name	Seed Source (1)	Total Yield cwt/a	Market Yield % of Sup.	Spec. Grav.	% O v e r			Culls	% Tuber Sizes (2)				
					1	7/8	2 ½		1	2	3	4	5
B1214-7	cf	503	460	1.077	96	64	64	4	4	32	49	15	0
Salem	ct	511	458	1.061	95	61	61	5	5	34	44	16	1
Reba	ct	491	453	1.071	95	57	57	2	5	38	39	16	2
B1240-1	cf	479	445	1.080	95	45	45	2	5	50	37	7	0
NorValley	ct	489	431	1.066	90	35	35	2	10	55	32	3	0
Atlantic	cf	481	430	1.078	91	28	28	1	9	63	24	4	0
B1414-6	cf	481	429	1.078	93	45	45	4	7	48	37	8	0
B1625-9	cf	466	419	1.062	91	46	46	2	9	45	38	8	0
B1072-21	cf	414	393	1.064	98	76	76	3	2	22	51	24	1
B1321-21	cf	446	392	1.073	89	34	34	1	11	55	30	5	0
B1435-15	cf	445	392	1.077	92	49	49	4	8	43	40	9	0
B1429-A3	cf	458	367	1.064	82	18	18	2	18	64	16	2	0
B1240-14	cf	431	364	1.071	87	26	26	3	13	61	21	5	0
B1452-18	cf	440	357	1.064	85	18	18	5	15	67	17	1	0
B1088-37	cf	403	355	1.069	93	36	36	4	7	57	32	4	0
B1110-11	cf	397	333	1.074	84	25	25	1	16	59	22	3	0
B0564-9	cf	360	326	1.063	91	37	37	0	9	54	31	6	0
B1440-18	cf	359	319	1.064	90	29	29	1	10	61	26	3	0
B1309-23	cf	351	309	1.072	89	21	21	1	11	69	18	2	0
Superior	cf	337	304	1.071	92	23	23	2	8	68	23	0	0
B1425-9	cf	385	298	1.075	79	17	17	2	21	61	15	2	0
B0178-34	cf	359	295	1.080	86	23	23	4	14	62	22	2	0
B1065-51	cf	329	283	1.065	91	20	20	5	9	71	18	2	0
B1450-26	cf	164	15	1.053	9	0	0	17	91	9	0	0	0
CV (3)		16	14	.42	3	18							
W-D Bayes LSD.05		91	67	.006	3	8		3	3	7	7	5	ns

(1) cf = USDA Breeding Program at the Chapman Farm and ct = Maine Certified Seed.
 (2) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 ½, S3= 2 ½ to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.
 (3) CV=Coef of Variation; W-D Bayes LSD.05=Waller Duncan Test For Least Significant Difference.

New Jersey Table 4. Plant and Tuber Characteristics, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings in Variety Table 3 (1).

Variety	PLANT			TUBER CHARACTERS							TUBER DEFECTS (2)							OVER ALL	Comments	
	P	A	a	M	S	C	T	S	D	T	S	G	H	S	H	N	R			CC
B1214-7	7	7	7	7	2	8	7	2	6	6	8	9	9	1	1	10	6	7	ok+	y+ hn sb- SG+
Salem	6	7	7	7	4	8	8	3	5	6	8	9	9	7	0	17	6		yes	hn SG- y+
Reba	6	7	6	5	5	7	7	3	6	7	9	9	9	5	2	14	7	3	yes	hh hn sb- ch+
B1240-1	7	8	8	3	3	7	6	3	8	8	9	8	9	2	2	11	6	5	yes	y+ SG+ sb-- hn
NorValley	6	6	6	6	6	8	8	2	6	7	7	9	9	5	0	12	6	5	yes	hn sb- SG-
Atlantic	7	7	4	5	5	6	5	2	8	7	8	9	9	3	4	32	5	6	std	hn sb-
B1414-6	6	8	6	3	3	7	7	3	6	6	8	8	9	5	0	24	6	5	ok	hn
B1625-9	7	7	8	5	5	8	7	2	5	6	8	9	9	1	0	6	7	6	ok+	y+ bad scab
B1072-21	7	6	6	7	7	8	7	2	4	7	8	9	9	1	5	18	6	5	no	hh hn y+
B1321-21	6	7	6	5	5	7	6	3	8	8	8	7	9	2	0	8	7	5	ok+	sb- gc
B1435-15	6	6	5	6	6	7	6	2	7	8	9	8	9	4	0	31	5	4	no	hn
B1429-A3	6	6	3	4	4	7	7	2	5	6	8	7	9	1	0	3	7	6	no	s-- SG- sb--
B1240-14	7	8	7	2	2	7	6	2	8	7	8	9	9	1	12	19	6	6	no	hh hn scab
B1452-18	8	7	5	7	7	7	6	3	4	6	6	7	8	7	0	2	7	6	ok	y- sg SG- ch+
B1088-37	4	4	3	7	7	7	7	2	6	7	9	7	9	9	0	12	6	6	ok+	hn no scab
B1110-11	6	7	5	5	5	7	6	3	8	8	9	9	9	3	0	26	5	3	no	hn ch+
B0564-9	4	5	4	8	8	7	6	2	8	8	9	9	9	2	0	4	8	3	yes	mod scab ch+
B1440-18	6	6	5	5	5	8	7	3	6	6	9	9	9	3	0	0		2	no	y- s- SG- ch+
B1309-23	6	7	5	5	5	7	6	2	7	7	8	9	9	1	1	21	5	3	no	hn ch+
Superior	5	7	2	8	8	7	6	4	7	7		9	9	6	0	6	8	5	std	some scab
B1425-9	5	6	3	8	3	7	7	3	7	6	9	9	9	3	2	2	7	4	no	app- s- ch+
B0178-34	6	6	5	5	5	8	8	2	7	7	9	9	9	1	0	10	6	5	ok+	8bc bad scab
B1065-51	4	5	2	8	8	7	5	2	7	7	7	9	9	8	0	1	6	5	ok	y-- s-
B1450-26	7	6	5	7	7	8	8	8	7	2	6	9	9	6	1	0	24	4	no	hn sb-

(1) See New Jersey Rating Table on back cover for abbreviations and ratings for plant and tuber characteristics, tubers defects, chip color and comments.

(2) HH = No. of Hollow Heart tubers out of 40. HN = No. of Heat Necrosis tubers out of 40 cut.

New Jersey Table 5. Yields, Specific Gravities, and Tuber Sizes for 24 Round White Potato Varieties, Harvested Late Season and Grown on a Sandy Loam Soil at the Rutgers Agricultural Res. & Ext. Center - Upper Deerfield, NJ - 1998.

Variety Name	Seed Source (1)	Total Yield		Spec. Grav.	% O v e r			Culls	% Tuber Sizes (2)				
		Yield cwt/a	Market Yield cwt/a		1	7/8	2 ½		1	2	3	4	5
B1240-1	cf	598	563	1.065	97	77	77	3	3	21	56	21	0
Katahdin	ne	575	548	1.059	96	50	50	1	4	46	41	9	0
Salem	ct	567	521	1.058	96	73	73	5	4	23	40	32	2
Atlantic	ne	549	520	1.073	96	50	50	1	4	46	41	9	0
Kennebec	ne	575	516	1.063	96	57	57	6	4	39	44	13	0
NY 120	ny	545	515	1.077	96	53	53	2	4	43	42	11	0
NY 112	ny	545	510	1.072	94	43	43	1	6	51	34	8	0
Snowden	cf	541	504	1.074	94	42	42	1	6	52	34	8	0
Reba	ct	500	475	1.068	97	65	65	2	3	32	46	18	0
B1321-21	cf	502	457	1.072	92	48	48	2	8	44	42	6	0
B1429-A3	cf	507	456	1.063	90	33	33	0	10	57	31	2	0
Atlantic	ct	484	449	1.072	95	47	47	2	5	48	38	9	0
AtBt 4-31	ct	481	436	1.071	93	36	36	2	7	57	29	7	0
AtBt 4-36	ct	469	432	1.072	94	40	40	2	6	54	30	10	0
AtBt 4-06	ct	474	431	1.070	94	43	43	4	6	51	36	7	0
B0178-34	cf	468	423	1.078	94	48	48	4	6	46	39	10	0
NorValley	ct	474	420	1.065	91	36	36	3	9	55	30	6	0
NY 103	ne	400	383	1.062	99	70	70	3	1	28	52	18	0
B0564-8	cf	428	381	1.068	89	24	24	0	11	65	20	4	0
B1065-51	cf	406	369	1.062	93	31	31	3	7	63	28	2	0
B0564-9	cf	388	362	1.066	94	47	47	1	6	46	38	10	0
B1425-9	cf	418	354	1.075	87	27	27	3	13	60	22	5	0
Superior	ne	379	351	1.064	95	25	25	2	5	69	22	3	0
B0766-3	cf	366	340	1.067	95	34	34	2	5	61	31	3	0
CV (3)		12	13	.35	2	19							
W-D Bayes	LSD.05	81	82	.005	3	11		2	3	10	10	7	1

(1) cf = USDA Chapman Farm, ct = Certified Seed, ne = NE Regional Proj., ny = Cornell Univ.
(2) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 ½, S3= 2 ½ to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.
(3) CV=Coef of Variation; W-D Bayes LSD.05=Waller Duncan Test For Least Significant Difference.

New Jersey Table 6. Plant and Tuber Characteristics, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings in Variety Table 5 (1).

Variety	PLANT			TUBER CHARACTERS									TUBER DEFECTS (2)							OVER ALL	Comments	
	P	A	M	S	S	C	T	S	h	p	a	T	S	G	H	S	B	H	N			R
B1240- 1	8	8	8	4	4	7	7	5	5	6	8	8	7	7	9	4	7	5	7	ok+	nice	
Katahdin	8	8	8	4	4	8	8	2	2	3	8	8	9	9	9	2	0	19	6	std	scab hn green	
Salem	7	7	7	5	5	8	9	2	2	6	7	7	7	7	9	8	0	17	6	yes	hn	
Atlantic	7	7	6	6	6	7	6	3	3	8	7	7	9	9	9	5	4	39	2	std	bad hn	
Kennebec	8	8	8	3	3	8	8	4	4	5	5	7	7	7	9	3	3	7	6	std	scab app-	
NY 120	6	7	7	8	7	7	5	2	2	7	7	7	9	9	9	8	0	5	6	yes	good	
NY 112	7	7	7	7	7	7	5	3	3	6	8	8	8	9	9	6	0	34	5	no	hn	
Snowden	7	5	7	8	7	7	6	2	2	6	8	8	7	9	9	7	0	20	5	yes	hn	
Reba	7	8	7	7	7	8	7	3	3	6	8	8	9	9	9	7	11	4	6	yes	hh	
B1321-21	8	8	6	8	7	7	7	4	4	7	7	7	7	8	9	5	0	3	7	yes	good	
B1429-A3	6	7	7	9	7	7	6	2	2	7	8	8	9	9	9	2	0	9	6	ok-	bad scab	
Atlantic	8	8	7	7	7	7	6	2	2	8	7	7	7	7	7	5	6	40	3	std	hn y-	
AtBt 4-31	7	8	7	8	7	7	6	3	3	7	8	8	9	8	9	6	3	36	2	no	hn	
AtBt 4-36	6	7	6	7	7	7	6	3	3	7	7	7	8	8	9	7	8	32	3	no	hn	
AtBt 4-06	7	7	6	6	6	7	6	2	2	6	6	6	9	7	9	6	1	37	4	no	hn	
B0178-34	6	5	6	5	5	8	7	2	2	5	6	6	8	9	9	2	2	32	5	ok+	hn bad scab	
NorValley	7	7	6	5	5	8	8	3	3	6	8	8	6	9	9	4	0	17	6	yes	hn sg	
NY 103	7	6	5	9	9	9	8	3	3	5	7	7	8	9	9	8	0	5	7	ok+	y-	
B0564- 8	5	6	2	9	9	7	5	2	2	8	8	8	8	9	9	7	0	0		yes	small	
B1065-51	4	6	4	8	7	7	5	5	5	6	7	7	8	7	9	9	0	7	6	yes	no scab small	
B0564- 9	3	5	3	9	9	7	7	2	2	8	8	8	9	9	9	3	1	4	6	yes	y-	
B1425- 9	6	6	5	9	9	6	8	2	2	6	7	7	7	9	9	5	0	4	6	ok+	yf 5bc	
Superior	6	6	2	9	9	7	6	3	3	6	7	7	7	8	9	8	0	7	7	std		
B0766- 3	6	6	4	9	9	7	7	2	2	8	8	8	9	9	9	8	0	0		ok+	y-	

(1) See New Jersey Rating Table on back cover for abbreviations and ratings for plant and tuber characteristics, tubers defects, chip color and comments.

(2) HH = No. of Hollow Heart tubers out of 40. HN = No. of Heat Necrosis tubers out of 40 cut.

New Jersey Table 7. Yields, Specific Gravities, and Tuber Sizes for 150 Potato Seedlings,
Harvested Main Season and Grown on a Sandy Loam Soil at the Rutgers
Agricultural Res. & Ext. Center - Upper Deerfield, NJ - 1998.

Variety Name	Seed Source (1)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			Culls	% Tuber Sizes (2)				
			cwt/a	% of Sup.		1	7/8	2		1	2	3	4	5
B1136-1	cf	257	167	56	1.071	65	2	4	32	63	2	0	0	0
B1136-23	cf	267	225	75	1.072	84	7	1	15	77	7	0	0	0
B1136-29	cf	330	308	103	1.075	94	27	2	4	67	24	3	0	0
B1741-10	cf	318	283	94	1.071	89	46	6	5	43	41	5	0	0
B1739-24	cf	292	182	61	1.065	62	2	1	37	60	2	0	0	0
B1415-7	cf	433	402	134	1.076	93	55	2	5	38	50	4	0	0
B1452-10	cf	272	104	35	1.066	38	0	2	60	38	0	0	0	0
B1566-6	cf	438	360	120	1.070	82	18	1	17	64	16	2	0	0
B1612-2	cf	359	287	96	1.077	80	6	0	20	74	6	0	0	0
B1625-8	cf	368	275	92	1.074	75	7	2	23	68	6	1	0	0
B1635-20	cf	407	316	105	1.066	78	5	2	20	73	5	0	0	0
B1638-9	cf	399	236	79	1.075	59	3	8	33	57	3	0	0	0
B1639-9	cf	317	227	76	1.077	72	2	0	28	70	2	0	0	0
B1645-11	cf	270	147	49	1.078	54	2	0	46	52	2	0	0	0
B1645-14	cf	333	293	98	1.065	88	22	2	10	66	19	3	0	0
B1649-8	cf	324	259	86	1.069	80	19	3	18	61	15	4	0	0
B1652-3	cf	143	45	15	1.063	31	0	1	67	31	0	0	0	0
B1662-2	cf	283	224	75	1.071	79	8	2	19	71	8	0	0	0
B1662-5	cf	281	236	79	1.068	84	8	0	16	76	8	0	0	0
B1662-19	cf	283	209	70	1.070	74	2	2	24	71	2	0	0	0
B1662-20	cf	190	52	17	1.057	27	0	1	72	27	0	0	0	0
B1700-2	cf	277	217	72	1.065	79	11	0	22	68	11	0	0	0
B1701-1	cf	380	225	75	1.066	59	2	0	41	57	2	0	0	0
B1703-3	cf	263	172	57	1.064	65	3	4	30	62	3	0	0	0
B1703-9	cf	292	263	88	1.067	90	12	0	10	78	12	0	0	0
B1705-12	cf	451	385	128	1.074	85	33	2	13	53	31	2	0	0
B1709-4	cf	339	297	99	1.061	88	16	0	12	72	15	1	0	0
B1709-5	cf	299	178	59	1.053	60	3	0	40	57	3	0	0	0
B1709-6	cf	559	472	157	1.057	84	57	14	2	27	41	17	0	0
B1709-7	cf	274	219	73	1.056	80	15	0	20	65	15	0	0	0

New Jersey Table 7. (Continued.)

Variety Name	Seed Source (1)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (2)				
						1	7/8	2 ½		1	2	3	4	5
B1710- 8	cf	178	6	2	1.064	4	0	0	17	80	4	0	0	0
B1711- 8	cf	456	422	141	1.065	92	35	35	2	6	57	32	4	0
B1711-16	cf	236	189	63	1.074	80	10	10	1	19	70	10	0	0
B1711-18	cf	407	376	125	1.077	92	52	52	2	6	40	45	8	0
B1712- 7	cf	290	234	78	1.070	81	21	21	0	19	60	20	2	0
B1712-18	cf	365	292	97	1.062	80	5	5	0	20	75	5	0	0
B1714- 2	cf	402	310	103	1.067	77	3	3	3	20	74	3	0	0
B1716- 1	cf	422	299	100	1.073	71	6	6	2	27	65	6	0	0
B1735- 5	cf	326	253	84	1.067	78	17	17	5	17	61	17	0	0
AF1956- 1	me	382	312	104	1.056	82	28	28	12	6	53	28	1	0
AF1470- 6	me	401	383	128	1.056	96	40	40	2	3	55	37	3	0
AF1475-20	me	541	483	161	1.062	89	54	54	7	4	35	41	13	0
AF1791- 1	me	639	586	195	--	92	50	50	5	3	42	34	17	0
AF1845- 6	me	514	475	158	1.067	92	49	49	4	3	43	39	11	0
AF1877- 5	me	459	346	115	1.060	75	34	34	16	9	41	30	4	0
AF1896- 2	me	444	388	129	1.072	87	24	24	0	12	63	24	1	0
AF1896- 5	me	342	333	111	1.081	97	61	61	1	2	36	53	8	0
AF1897- 2	me	476	454	151	1.063	95	76	76	3	1	19	43	34	0
AF1898- 2	me	411	358	119	1.073	87	67	67	11	2	20	56	11	0
AF1899- 1	me	443	236	79	1.085	53	4	4	1	46	49	4	0	0
AF1907- 6	me	360	326	109	1.063	90	39	39	4	6	52	35	4	0
AF1908- 1	me	512	439	146	1.057	86	37	37	3	11	49	30	7	0
AF1908- 4	me	467	440	147	1.063	94	53	53	1	4	41	40	13	0
AF1921- 4	me	469	430	143	1.061	92	56	56	3	5	36	47	9	0
AF1921- 5	me	388	353	118	1.065	91	34	34	1	8	58	30	4	0
AF1921- 7	me	559	446	149	1.059	80	26	26	12	8	54	25	1	0
AF1921- 9	me	561	521	174	1.065	93	72	72	4	3	21	50	22	0
AF1924- 1	me	379	351	117	1.064	93	30	30	0	7	62	27	3	0
AF1925- 1	me	357	337	112	1.069	94	67	67	0	5	28	46	21	0
AF1935- 6	me	534	452	151	1.080	85	38	38	7	9	47	35	2	0

New Jersey Table 7. (Continued.)

Variety Name	Seed Source (1)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			Culls	% Tuber Sizes (2)				
						1	7/8	2 1/2		1	2	3	4	5
AF1937- 4	me	532	485	162	1.065	91	54	4	4	5	37	41	14	0
AF1938- 2	me	307	245	82	1.062	80	26	5	5	15	54	23	3	0
AF1938- 3	me	523	501	167	1.068	96	58	2	2	2	38	46	11	0
AF1949- 1	me	555	521	174	1.072	94	55	2	2	4	39	45	10	0
AF1950- 1	me	523	503	168	1.070	96	67	3	3	1	29	58	9	0
AF1953- 4	me	444	373	124	1.069	84	24	5	5	11	60	20	4	0
NY 121	ny	364	310	103	1.071	85	10	0	0	15	75	10	0	0
NY 122	ny	424	309	103	1.069	73	24	16	16	11	49	20	4	0
NY R17-11	ny	383	365	122	1.063	95	45	0	0	5	50	39	6	0
NY R17-19	ny	425	402	134	1.063	95	37	2	2	3	58	33	4	0
NY S 31- 1	ny	590	546	182	1.058	92	46	3	3	4	46	43	4	0
NY S 27- 2	ny	357	333	111	1.066	93	20	0	0	7	73	20	0	0
NY S 33- 5	ny	212	174	58	1.067	82	15	2	2	16	67	13	2	0
NY S 3- 1	ny	400	368	123	1.061	92	48	2	2	6	44	44	4	0
NY S 4- 3	ny	350	325	108	1.064	93	31	0	0	7	61	30	1	0
NY S300-13	ny	334	319	106	1.064	95	28	0	0	5	67	25	3	0
NY S300- 7	ny	257	217	72	1.070	84	20	0	0	16	64	15	5	0
NY S106-17	ny	482	429	143	1.062	89	33	2	2	9	56	26	7	0
NY S 34- 3	ny	286	261	87	1.067	91	41	5	5	4	50	37	4	0
NY S 14- 2	ny	434	382	127	1.072	88	24	1	1	11	64	24	0	0
NY S 31- 7	ny	278	248	83	1.066	89	29	1	1	9	60	24	5	0
NY S300- 1	ny	326	211	70	1.071	65	2	0	0	35	63	2	0	0
NY S 28- 2	ny	428	379	126	1.072	89	21	0	0	11	68	18	2	0
NY S 4- 2	ny	526	466	155	1.066	89	34	3	3	8	55	29	6	0
NY S 32- 2	ny	606	584	195	1.069	96	60	0	0	4	36	51	10	0
NY S 26- 2	ny	477	455	152	1.068	95	49	0	0	5	46	35	14	0
NY S300- 9	ny	258	250	83	1.080	97	61	2	2	1	36	43	18	0
NY S 32- 3	ny	364	335	112	1.070	92	28	0	0	8	65	26	1	0
NY S 31- 3	ny	360	310	103	1.064	86	26	3	3	11	60	20	7	0

New Jersey Table 7. (Continued.)

Variety Name	Seed Source (1)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (2)				
						% O v e r				% Tuber Sizes (2)				
						1	7/8	2 ½		1	2	3	4	5

Red Skinned Seedlings															
Blue Mac	cf	418	254	85	1.071	61	18	29	10	43	18	0	0		
Cherry Red	cf	264	180	60	1.074	68	47	15	17	22	32	15	0		
Chieftain	cf	537	452	151	1.066	84	41	7	8	43	31	10	0		
Chieftain	ne	452	409	136	1.064	91	38	3	6	52	32	6	0		
NorDonna	ne	478	429	143	1.060	90	36	5	5	53	34	2	0		
Norland	cf	520	405	135	1.062	78	27	8	14	51	21	6	0		
Dark Red	ne	549	404	135	1.057	74	16	10	17	57	16	0	0		
Norland															
Super Red	cf	281	241	80	1.057	86	15	1	13	71	12	3	0		
Norland															
Rideau	cf	537	445	148	1.067	83	30	8	10	53	22	8	0		
B0811- 4	cf	217	91	30	1.076	42	0	13	45	42	0	0	0		
B0852- 7	cf	489	375	125	1.068	77	22	6	17	55	14	7	0		
B1145- 2	cf	193	66	22	1.066	34	0	15	51	34	0	0	0		
B1491- 5	cf	418	322	107	1.069	77	42	9	14	35	25	18	0		
B1491-20	cf	223	77	26	1.062	34	0	14	52	34	0	0	0		
B1492- 6	cf	546	452	151	1.079	83	25	10	7	58	22	3	0		
B1492-10	cf	426	229	76	1.065	54	11	12	35	43	11	0	0		
B1492-12	cf	584	338	113	1.070	58	8	9	33	50	8	0	0		
B1493- 1	cf	512	388	129	1.069	76	24	10	15	52	18	6	0		
B1493- 3	cf	581	452	151	1.071	78	27	9	13	51	20	7	0		
B1493- 8	cf	380	333	111	1.071	88	33	2	11	54	32	1	0		

New Jersey Table 7. (Continued.)

Variety Name	Seed Source (1)	Total Market Yield		Spec. Grav.	% O v e r		% Culls	% Tuber Sizes (2)				
		cwt/a	cwt/a		1 7/8	2 1/2		1	2	3	4	5
B1495- 6	cf	515	388	1.068	75	19	6	19	56	13	6	0
B1495-15	cf	465	414	1.070	89	25	1	10	64	24	1	0
B1521- 2	cf	569	463	1.065	81	35	5	13	47	28	7	0
B1522- 1	cf	254	195	1.061	77	22	8	16	55	19	3	0
B1522- 6	cf	449	374	1.058	83	55	8	9	28	37	18	0
B1524- 2	cf	435	356	1.059	82	34	8	10	48	24	10	0
B1526- 1	cf	460	356	1.065	77	50	10	13	28	24	16	10
B1529- 1	cf	557	443	1.064	80	41	16	5	39	27	14	0
B1749- 1	cf	537	424	1.063	79	53	11	10	26	32	21	0
B1749- 5	cf	310	294	1.064	95	37	1	4	58	31	6	0
B1749-15	cf	485	404	1.071	83	67	13	3	17	32	31	4
B1756-10	cf	231	189	1.058	82	27	3	15	54	27	0	0
B1758- 2	cf	280	221	1.063	79	14	3	18	65	11	3	0
B1758- 3	cf	539	413	1.062	77	32	11	13	45	32	0	0
B1758-14	cf	252	188	1.061	75	7	2	23	67	7	0	0
B1759- 3	cf	170	30	1.070	18	0	29	53	18	0	0	0
B1761- 1	cf	407	374	1.061	92	34	0	8	58	34	0	0
B1761- 8	cf	219	169	1.069	77	10	1	22	67	10	0	0
B1763- 4	cf	361	336	1.070	93	33	1	5	60	29	4	0

New Jersey Table 7. (Continued.)

Variety Name	Seed Source (1)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r		% Culls	% Tuber Sizes (3)				
			cwt/a	% of Sup.		4 oz	8 oz		1	2	3	4	5
Russet Seedlings													
B9922-11	cf	269	225	75	1.075	84	19	5	11	65	19	0	0
B1409- 2	cf	387	344	115	1.067	89	31	4	8	58	25	6	0
B1452- 3	cf	279	198	66	1.071	71	12	4	25	59	12	0	0
B1463- 1	cf	169	94	31	1.055	56	2	13	32	54	2	0	0
B1463-12	cf	259	101	34	1.051	39	7	5	57	32	7	0	0
B1639- 5	cf	238	132	44	1.062	56	1	7	38	55	1	0	0
B1730- 4	cf	136	83	28	1.071	61	24	36	4	37	24	0	0
B1730-22	cf	366	313	104	1.070	85	32	7	7	54	29	2	0
B1730-30	cf	263	181	60	1.071	69	11	13	18	58	11	0	0
B1739- 1	cf	210	129	43	1.074	61	0	4	34	61	0	0	0
B1739- 3	cf	229	192	64	1.065	84	17	6	10	67	17	0	0
B1746- 4	cf	286	231	77	1.063	81	30	8	11	51	28	2	0
A86102-6	ne	359	270	90	1.078	75	26	15	10	49	24	3	0
A84180-8	ne	348	257	86	1.066	74	25	17	10	49	25	0	0
A84118-3	ne	295	263	88	1.070	89	33	4	6	56	30	4	0
CO83008-1	ne	205	187	62	1.069	92	9	3	5	83	5	4	0
Norkotah 8	ne	477	430	143	1.067	90	48	4	5	42	39	9	0
Norkotah 3	ne	395	312	104	1.073	79	40	15	6	39	38	1	0
Norkotah	ne	334	289	96	1.070	87	23	4	10	64	23	0	0
Century	ne	348	255	85	1.074	73	17	16	11	56	17	0	0
Atlantic	ne	435	398	133	1.073	92	36	1	7	56	28	8	0
Superior	ne	332	300	100	1.067	90	22	1	9	68	18	3	0

(1) cf = USDA Chapman Farm, ne = NE Regional Proj., ny = Cornell Univ. and me = Univ. of Maine.

(2) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 1/4, S3= 2 1/4 to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.

(3) Size 1= Under 4 oz., S2= 4 TO 8 oz., S3= 8 to 12 oz, S4= 12 to 16 oz. S5= Over 16 oz.

New Jersey Table 8. Plant and Tuber Characteristics, Tuber Defects, Chip Defects, Chip Color and Overall Rating for Varieties and Seedlings in Variety Table 7 (1).

Variety	PLANT			TUBER CHARACTERS					TUBER DEFECTS (2)										OVER		Comments
	P	A	M	S	C	T	S	D	T	S	G	H	S	B	H	H	N	R	CC	AL/L	
	A	P	t	S	l	x	h	p	a	G	C	S	B	1	0	0	0	0	0	no	
B1136-1	4	7	3	8	7	7	6	7	5	6	7	9	1	0	0	0	0	1	7	no	2bc
B1136-23	4	7	4	8	7	6	2	6	7	9	9	9	6	0	0	0	0	0	0	no	s-
B1136-29	6	6	3	7	7	7	5	5	5	9	7	9	4	0	0	0	0	0	0	no	s-
B1741-10	5	4	2	8	8	8	5	6	5	5	9	9	5	0	0	0	0	0	0	no	y-
B1739-24	5	4	3	6	7	7	8	7	6	9	9	9	1	0	0	0	0	0	0	no	y-
B1415-7	8	8	6	2	7	6	2	8	7	9	9	9	3	0	4	5	0	0	0	no	sb hn
B1452-10	6	6	3	7	7	6	4	7	6	9	9	9	1	0	0	0	0	0	0	no	no
B1566-6	5	4	3	7	7	6	2	3	8	9	9	9	7	0	6	5	0	0	0	no	hn
B1612-2	6	7	5	7	8	8	2	8	8	9	9	9	1	0	6	5	0	0	0	no	hn
B1625-8	6	6	3	7	7	6	2	6	7	9	9	9	4	0	0	0	0	0	3	no	s-
B1635-20	6	7	2	7	7	7	2	8	6	9	9	9	4	0	6	6	0	0	0	no	s- hn
B1638-9	7	6	6	6	8	7	8	6	6	6	9	9	1	0	7	5	0	0	0	no	hn
B1639-9	5	6	3	8	6	7	8	6	6	9	9	9	1	0	0	0	0	0	0	no	y-s-
B1645-11	5	5	1	6	7	6	5	7	7	9	9	9	3	0	1	8	0	0	0	no	y-s-
B1645-14	4	5	1	8	7	8	5	7	7	9	9	9	4	0	1	7	0	0	0	ok	y-
B1649-8	4	5	2	4	7	7	9	7	6	9	9	9	2	0	9	5	0	0	0	no	hn
B1652-3	3	4	1	8	6	7	9	7	6	9	9	9	1	0	0	0	0	0	0	no	y-- s-
B1662-2	4	5	1	8	6	8	6	6	6	9	9	9	9	0	8	6	0	0	0	no	hn
B1662-5	4	5	1	8	7	8	5	5	7	9	9	9	1	0	6	5	0	0	0	no	hn
B1662-19	5	6	1	8	6	4	8	6	5	9	9	9	5	0	8	6	0	0	0	no	hn
B1662-20	2	3	1	8	8	8	8	6	6	9	9	9	1	0	5	5	0	0	0	no	hn
B1700-2	4	6	3	8	8	8	2	7	7	9	9	9	7	0	0	0	0	0	0	ok	y- s- app+
B1701-1	6	7	2	8	8	8	7	6	6	7	9	9	1	0	5	5	0	0	0	no	hn
B1703-3	4	5	3	4	7	6	4	7	6	6	9	9	1	0	0	0	0	0	0	no	y- s-
B1703-9	5	7	3	6	7	7	4	7	6	9	9	9	1	0	0	0	0	0	0	no	y- s-
B1705-12	8	7	4	7	8	8	2	8	8	9	9	9	1	1	5	6	0	0	0	no	sb-- hn
B1709-4	7	6	4	7	8	8	2	8	7	9	9	9	1	0	1	8	0	0	0	no	sb-- y- s-
B1709-5	6	8	2	4	7	8	2	8	8	9	9	9	9	0	0	0	0	0	0	no	sb-- y-- s--
B1709-6	7	7	6	2	8	8	2	2	5	6	9	9	9	0	0	0	0	0	4	yes	y+ no scab ch+
B1709-7	6	7	5	8	8	7	4	5	6	9	9	9	1	0	0	0	0	0	0	no	sb- y- s-

New Jersey Table 8. (Continued.)

Variety	PLANT			TUBER CHARACTERS					TUBER DEFECTS(2)								OVER		Comments	
	P	A	M	S	C	T	S	D	T	S	G	H	S	B	H	N	R	CC		ALL
B1710- 8	4	4	1	8	8	8	2	8	7	9	9	9	1	0	0	0	0		no	y- sb-
B1711- 8	6	7	5	4	8	7	2	8	8	9	9	9	9	0	0	3	7	3	yes	y+ no scab ch+
B1711-16	5	7	4	7	8	8	3	6	6	9	9	9	1	0	0	0	0		no	sb-- y-
B1711-18	7	7	7	4	8	7	2	8	7	9	9	9	1	1	0	0	0		yes	y+ SG+ sb-
B1712- 7	5	6	2	8	7	6	2	8	8	8	9	9	4	0	0	1	8		no	y- s-
B1712-18	6	6	4	4	7	7	2	8	7	9	9	9	1	0	0	0	0		no	y- s-
B1714- 2	7	7	6	8	7	7	3	6	7	9	9	9	1	0	0	0	0		no	s-- y-- sb-
B1716- 1	6	6	5	2	8	7	7	7	6	9	9	9	1	0	0	1	8		no	s-- sb-
B1735- 5	5	7	2	4	8	8	7	8	5	9	9	9	5	0	0	0	0		no	y- s-
AF1956- 1	8	8	6	8	8	8	5	6	3	6	7	9	1	1	5	4			no	hn sb-
AF1470- 6	7	7	4	7	8	8	2	5	6	9	9	9	1	0	0	5	5	6	no	hn bad scab s+
AF1475-20	7	8	7	6	8	7	2	8	7	7	9	7	4	1	10	5			no	hn sb
AF1791- 1	6	6	5	-	-	-	2	7	6	-	-	-	1	-	-	-	7	4	no	100% scab cover
AF1845- 6	8	8	6	6	8	8	2	7	6	9	9	9	1	0	0	1	7		yes	bad scab y++ ch+
AF1877- 5	6	6	4	6	8	9	9	7	6	9	9	9	1	1	0	0			no	bad scab
AF1896- 2	6	8	2	7	8	7	4	5	6	9	9	9	7	0	0	2	7	4	yes	3bc ch+ y+
AF1896- 5	6	8	4	5	7	7	2	8	6	9	9	9	9	2	4	7			try	1bc no scab
AF1897- 2	7	8	3	5	7	7	3	7	7	9	7	9	9	0	9	4			no	hn no scab
AF1898- 2	7	7	6	3	7	7	4	6	6	7	9	9	9	0	10	4			no	hn no scab
AF1899- 1	7	8	6	3	7	7	2	8	7	9	9	9	9	0	7	6			no	hn no scab
AF1907- 6	6	6	3	4	8	8	2	8	8	9	9	9	9	0	3	7	4	4	ok	1bc ch+ no scab
AF1908- 1	7	8	2	2	8	7	2	8	7	7	9	9	9	0	4	6	5		no	hn
AF1908- 4	7	8	5	7	8	8	3	6	7	9	9	9	1	0	9	3			no	hn
AF1921- 4	6	7	4	4	7	6	2	6	7	7	9	9	4	1	1	7			try	SG- y+
AF1921- 5	6	6	6	4	7	7	2	7	7	8	9	9	3	0	1	8			no	s- app-
AF1921- 7	7	7	7	4	8	7	3	6	6	5	8	6	3	0	0	0			ok	y+ sg sb-
AF1921- 9	7	8	4	4	7	7	2	8	8	9	9	9	6	0	0	4	6	5	ok	y+ app+ hn
AF1924- 1	6	7	3	5	8	8	3	5	7	7	9	9	1	0	0	7	5		no	hn
AF1925- 1	7	8	7	4	8	7	3	6	7	9	9	9	1	0	0	9	4		no	hn
AF1935- 6	8	9	8	4	8	7	2	8	7	7	6	9	5	0	0	8	6		no	hn

New Jersey Table 8. (Continued.)

Variety	PLANT				TUBER CHARACTERS				TUBER DEFECTS(2)										OVER		Comments	
	P	A	M	t	S	C	T	S	D	T	S	G	C	S	B	H	H	N	R	CC		ALL
AF1937- 4	7	8	4	4	4	7	8	3	7	6	8	7	9	1	0	2	7			ok+	Y+ bad scab	
AF1938- 2	6	7	4	9		8	8	5	6	7	9	7	9	7	0	8	5			6	no hn	
AF1938- 3	6	6	7	4		8	8	2	7	8	8	9	9	6	0	0			4	yes	Y+ ch+	
AF1949- 1	8	7	8	3		7	7	3	7	7	9	7	9	8	0	0				yes	Y+ SG+ great	
AF1950- 1	9	7	7	7		7	7	2	5	6	9	6	9	9	0	1	7		3	yes	Y+ no scab ch+	
AF1953- 4	8	7	7	3		7	8	6	7	7	8	7	9	1	0	0				ok	sb-	
NY 121	4	6	1	8		7	1	2	7	7	9	9	9	7	0	0				ok		
NY 122	8	8	6	9		7	7	8	6	3	6	9	9	2	0	0				no	app- bad scab	
NY R17- 11	6	7	3	7		7	7	2	8	7	9	9	9	9	0	0			3	yes	no scab app+ ch+	
NY R17- 19	5	7	3	5		8	7	4	5	7	9	9	9	9	0	0				ok	bad rot no scab	
NY S 31- 1	6	7	5	5		8	8	2	3	6	9	9	9	9	0	0			3	yes	Y+ ch+ no scab	
NY S 27- 2	4	5	3	7		7	5	3	7	7	9	9	9	9	0	0				ok	s- no scab	
NY S 33- 5	3	3	1	8		7	7	2	6	6	9	7	9	8	0	1	7			no	s-	
NY S 3- 1	6	7	3	8		7	6	2	8	8	9	9	9	9	0	6	6		5	no	hn no scab	
NY S 4- 3	7	8	3	6		8	8	3	4	6	9	9	9	7	0	1	7		3	no	Y- app- ch+	
NY S300-13	5	6	4	5		7	7	2	6	6	9	9	9	9	0	9	5			no	hn no scab	
NY S300- 7	6	7	3	6		7	7	2	6	6	9	9	9	9	0	2	8			no	Y- no scab	
NY S106-17	8	8	7	4		7	8	3	8	7	7	9	9	2	0	4	6			ok+	hn app- Y+	
NY S 34- 3	6	7	4	7		7	6	2	7	6	9	6	9	7	0	3	7			no	Y-	
NY S 14- 2	7	8	6	5		7	6	2	7	7	9	9	9	9	0	2	7		2	yes	ch+ Y+	
NY S 31- 7	4	5	2	5		7	7	2	6	7	9	9	9	9	0	1	8			no	Y- no scab	
NY S300- 1	5	5	3	8		7	7	2	3	7	9	9	9	9	0	0				no	Y- s-	
NY S 28- 2	7	8	4	6		7	7	3	5	6	9	9	9	7	0	0				ok+	Y+ sb-	
NY S 4- 2	7	8	6	7		7	6	3	7	6	8	9	9	8	0	0				yes	Y+	
NY S 32- 2	6	7	4	7		7	7	2	7	7	9	9	9	7	0	1	7			yes	Y+	
NY S 26- 2	7	7	4	4		7	7	3	6	7	9	9	9	9	0	5	6		3	try	hn ch+ no scab	
NY S300- 9	6	7	6	4		7	7	2	6	7	9	9	9	8	0	0				no	Y- s-	
NY S 32- 3	7	8	3	7		8	7	5	6	6	9	9	9	9	0	3	6			no	hn Y- no scab	
NY S 31- 3	8	9	8	5		7	7	2	7	6	9	9	9	1	0	6	7			no	bad scab hn	

New Jersey Table 8. (Continued.)

Variety	PLANT				TUBER CHARACTERS					TUBER DEFECTS (2)							OVER		Comments	
	P	A	M	S	C	T	S	D	T	S	G	H	S	B	H	N	R	CC		ALL
Red Skinned Seedlings																				
Blue Mac	8	8	8	1	1	8	8	7	1	1	9	1	1	1	0	8	4		no	hn y-
Cherry Red	5	6	4	8	2	6	3	7	6	9	6	9	7	7	0	0		ok+	gc netted	
Chieftain	4	5	4	4	2	7	2	8	7	8	9	9	9	9	0	7	5	no	bad hn	
Chieftain	5	5	2	5	2	8	2	6	7	7	9	9	9	9	0	7	7	std	hn pale no scab	
NorDonna	6	6	3	5	2	8	3	6	7	5	9	9	9	9	0	0		yes	y+ sg hs no scab	
Norland	4	6	3	8	2	8		3	7	6	9	9	6	6	0	6	6	std	hn	
Dark Red																				
Norland	6	7	2	4	2	8	3	6	7	6	7	9	7	7	0	1	8	yes	y+	
Super Red																				
Norland	5	6	3	2	2	8	2	8	8	9	9	9	9	9	0	5	6	no	hn	
Rideau	5	5	5	5	2	8	2	5	5	9	9	9	5	5	0	0		no	sb- app-	
B0811- 4	2	2	3	9	2	8	2	8	7	9	9	9	6	6	0	0		no	s-- netted	
B0852- 7	6	7	3	6	1	8	2	6	6	8	9	9	4	4	0	2	7	ok+	y+	
B1145- 2	2	4	2	8	2	7	2	8	7	9	9	9	9	9	-	-		no	y-	
B1491- 5	4	4	3	8	2	6		2	8	9		8	5	5	0	2	7	yes	dark red	
B1491-20	3	4	3	9	2	7	2	8	7	7	9	7	7	7	0	0		no	dark netted red	
B1492- 6	7	6	7	2	1	5	2	5	6	5	9	9	5	5	0	0		ok	y+ SG+ app-	
B1492-10	4	5	4	7	2	5	2	5	7	8	9	9	9	9	0	3	7	no	s-	
B1492-12	6	7	6	5	2	8	2	5	6	7	7	7	6	6	0	0		no	defects	
B1493- 1	6	6	3	8	2	6	2	7	7	7	8	9	9	9	0	9	7	ok	hn pale red	
B1493- 3	6	7	3	6	2	7	2	6	6	7	8	9	9	9	0	7	6	ok	y+ dark red net	
B1493- 8	7	7	3	4	2	8	2	6	7	9	9	9	9	9	0	5	7	ok+	hn no scab	

New Jersey Table 8. (Continued.)

Variety	PLANT			TUBER CHARACTERS									TUBER DEFECTS(2)									OVER		
	P	A	A p	M	S	S	C	T	S	D	T	a	G	C	S	B	H	N	R	CC	ALL	Comments		
B1495- 6	6	7	7	3	8	2	6	3	3	3	6	9	9	9	9	9	0	0			yes	y+ no scab		
B1495-15	7	7	7	4	5	1	5	3	6	8	9	9	9	9	6	0	2	7			yes	app+ y+		
B1521- 2	7	6	7	4	4	2	6	2	8	8	9	9	9	9	9	0	1	8			yes	nice red no scab		
B1522- 1	7	8	7	6	5	2	8	3	6	6	8	9	9	9	9	0	0			ok	app-			
B1522- 6	3	4	7	1	3	2	7	2	8	7	9	9	9	9	7	0	9	5			no	hn		
B1524- 2	7	7	7	2	4	2	5	2	7	7	9	9	9	9	9	0	1	8			ok+			
B1526- 1	7	7	7	5	8	2	7	2	8	7	7	7	7	9	9	3	2	7			yes	hh y+ gc no scab		
B1529- 1	5	7	7	7	3	1	8	3	7	6	6	7	6	9	9	0	0			yes	y+ dark purple			
B1749- 1	7	7	7	6	2	8	9	3	7	6	9	9	9	9	9	0	8	6			no	hn		
B1749- 5	6	8	7	7	5	8	7	2	7	6	9	9	9	9	9	0	7	6			no	hn no scab		
B1749-15	8	8	3	3	3	8	8	2	7	5	5	9	9	9	9	0	9	6			no	hn app- no scab		
B1756-10	4	4	4	3	4	1	7	5	3	6	8	9	9	9	9	0	0			no	app- no scab			
B1758- 2	3	3	3	3	8	1	8	3	5	6	9	9	9	9	4	0	0			no	sb-- s-			
B1758- 3	7	7	4	2	2	2	7	3	6	7	9	7	9	1	0	1	8			no	gc bad scab			
B1758-14	5	5	2	7	2	2	8	2	8	7	9	7	9	2	0	0			no	y-				
B1759- 3	6	6	3	4	2	2	7	8	7	2	3	9	9	9	9	0	0			no	sg app-			
B1761- 1	4	7	3	3	5	1	7	5	6	8	9	9	9	9	7	0	2	7			yes	v dark purple		
B1761- 8	3	7	1	7	2	2	6	4	4	6	9	9	9	9	5	0	0			no	s-- app-			
B1763- 4	6	7	3	3	1	1	6	3	7	7	9	9	9	9	4	0	0			no	v dark pur net			

New Jersey Table 8. (Continued.)

Variety	PLANT		TUBER CHARACTERS						TUBER DEFECTS (2)										OVER	
	P	A	M	S	C	T	S	D	T	S	G	H	S	B	H	N	R	CC	ALL	Comments
Russet Seedlings																				
B9922-11	6	6	6	7	5	2	8	7	5	8	9	9	3	3	0	5	5		no	hn app-
B1409-2	6	7	2	8	5	4	8	6	6	8	9	9	1	1	0	1	8		yes	bad scab
B1452-3	6	8	4	6	7	7	5	7	6	9	5	9	3	3	0	0		ok-	y- gc	
B1463-1	2	3	1	9	4	2	5	7	6	9	3	9	1	1	0	0		no	gc y-	
B1463-12	6	7	2	6	7	7	7	7	6	6	9	6	1	1	0	1	6		no	y- many defects
B1639-5	6	8	2	8	5	2	7	5	6	7	9	9	1	1	0	2	6		no	app- bad scab
B1730-4	3	7	3	8	5	3	7	7	5	7	7	9	8	8	0	9	5		no	hn app-
B1730-22	6	7	2	8	7	5	7	6	6	9	9	9	6	6	0	9	6		no	hn
B1730-30	4	7	2	8	5	3	8	7	6	7	8	9	9	9	4	4	7		no	app- hh sg
B1739-1	5	7	2	9	5	2	7	7	5	6	6	9	9	9	0	0		no	app- sg gc	
B1739-3	3	5	2	4	5	4	6	7	6	8	8	9	3	3	0	10	5		no	hn app-
B1746-4	6	8	3	8	5	4	5	3	4	7	7	7	5	5	0	3	7		ok	sg y? app- gc hs
A86102-6	8	8	6	4	5	3	7	7	5	9	9	9	9	9	6	0		no	hh app-	
A84180-8	8	8	7	7	5	3	9	7	7	6	9	9	8	8	0	0		ok+	sg	
A84118-3	9	9	7	5	5	4	8	7	7	8	9	9	9	9	0	0		yes	late	
CO83008-1	6	6	2	7	5	4	8	7	7	7	9	9	9	9	0	0		ok	y- s-	
Norkotah 8	8	8	6	9	5	3	8	7	8	9	9	9	6	6	0	1	7		yes	y+
Norkotah 3	8	9	8	7	5	3	8	7	7	6	9	9	9	9	0	2	6		yes	y+ no scab
Norkotah	6	8	2	6	5	3	7	6	5	8	9	9	5	5	0	1	8		ok	
Century	7	8	8	4	7	8	8	6	5	7	9	9	3	3	0	0		ok	app-	
Atlantic	7	7	5	4	7	6	2	8	8	9	5	9	5	5	4	54	5		5 std	hn
Superior	5	7	2	8	7	6	4	6	7	7	9	9	7	7	0	6	7		5 std	

(1) See New Jersey Rating Table on back cover for abbreviations and ratings for plant and tuber characteristics, tubers defects, chip color and comments.

(2) HH = No. of Hollow Heart tubers out of 10. HN = No. of Heat Necrosis tubers out of 10 cut.

New Jersey Table 9. Yields, Specific Gravities, and Tuber Sizes for 17 Round Potato Varieties, Harvested Late Season and Grown on a Silt Loam Soil at the Snyder Agricultural Research & Extension Farm near Pittstown, NJ - 1998.

Variety Name	Seed Source (1)	Total Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (2)				
		Yield cwt/a	Market Yield cwt/a		1	7/8	2 1/2		1	2	3	4	5
Atlantic	ct	620	571	1.100	97	81		5	3	16	34	40	7
Chieftain	ne	589	517	1.072	93	62		5	7	31	43	19	0
Salem	ct	585	511	1.081	90	66		3	10	24	34	26	6
Reba	ct	539	498	1.088	98	82		6	2	16	34	44	4
B1495-15	cf	543	493	1.084	95	62		4	5	33	47	15	0
NorDonna	ne	489	435	1.069	92	52		3	8	40	44	9	0
Chieftain	cf	472	433	1.072	97	74		5	3	23	45	27	2
Rideau	cf	502	404	1.080	95	70		15	5	25	45	25	0
Superior	ct	434	398	1.083	97	66		5	3	31	43	23	0
Norland	cf	435	364	1.072	93	65		9	7	28	48	16	0
Cherry Red	cf	375	348	1.080	95	71		3	5	25	47	22	1
B1495- 6	cf	352	315	1.085	91	39		2	9	52	35	3	1
Dark Red													
Norland	ne	329	310	1.068	96	53		2	4	43	41	11	1
Super Red													
Norland	cf	325	272	1.063	96	73		13	4	23	38	33	2
Andover	ct	289	262	1.091	94	59		4	6	35	49	10	0
B1145- 2	cf	152	131	1.063	88	19		2	12	69	19	0	0
B0811- 4	cf	77	43	1.092	56	0		2	44	56	0	0	0
CV (3)		15	15	.378	4	13							
W-D Bayes	LSD.05	82	74	.005	5	9		4	4	8	10	9	3

(1) cf = USDA Chapman Farm, ct = Maine Certified Seed and ne = Northeast Regional Project.

(2) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 1/2, S3= 2 1/2 TO 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.

(3) CV=Coef of Variation; W-D Bayes LSD.05= Waller Duncan Test For Least Significant Difference.

New Jersey Table 10. Plant and Tuber Characteristics, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings in Variety Table 9 (1).

Variety	PLANT			TUBER CHARACTERS							TUBER DEFECTS (2)							OVER	
	P	A	M	S	C	T	S	D	T	S	G	H	S	H	H	N	R	ALL	Comments
	A	p	t	S	S	l	x	h	p	a	G	C	S	B	H	N	R		
Atlantic	7	8	5	8	7	6		3	5	5	9	7	9	9	1	38	4	std	
Chieftain	8	9	4	8	2	7		2	3	7	8	8	9	9	0	24	5	no bad hn	
Salem	8	9	4	6	8	8		2	6	6	9	8	9	9	0	11	7	yes nice	
Reba	8	9	5	8	8	7		3	7	6	9	7	9	9	10	0		yes nice	
B1495-15	8	8	4	6	1	6		2	6	7	9	6	9	9	5	4	6	yes nice purple	
NorDonna	7	8	4	8	2	8		2	5	6	6	9	9	9	0	0		yes good color	
Chieftain	7	9	3	7	2	7		4	5	7	7	6	7	9	1	34	4	no bad hn	
Rideau	7	7	4	7	2	8		4	3	5	8	5	9	9	0	0		no app- good color	
Superior	7	9	3	9	2	7		3	2	6	8	7	9	9	0	1	7	std	
Norland	6	5	2	8	2	8		3	6	7	8	7	8	9	0	3	7	std	
Cherry Red	8	8	2	8	2	6		3	6	7	9	8	9	9	6	0		ok rough	
B1495- 6	7	7	2	8	2	6		3	5	7	9	8	9	9	0	1	7	ok y-	
Dark Red	6	6	2	8	2	8		3	6	8	9	7	9	9	0	4	7	yes nice	
Norland																			
Super Red	3	4	4	5	2	7		3	9	7	8	4	9	9	1	7	6	ok gc good color	
Norland	6	7	3	8	7	6		2	7	6	9	6	9	9	0	0		ok y-	
Andover	3	4	1	8	2	8		2	7	7	9	7	9	9	0	0		no y-	
B1145- 2																			
B0811- 4	4	5	1	9	2	8		2	8	7	9	7	9	9	0	0		ok v small nice red	

(1) See New Jersey Rating Table on back cover for abbreviations and ratings for plant and tuber characteristics, tubers defects, chip color and comments.

(2) HH = No. of Hollow Heart tubers out of 40. HN = No. of Heat Necrosis tubers out of 40 cut.

New Jersey Table 11.

Yields, Specific Gravities, and Tuber Sizes for 11 Russet Potatoes Varieties, Harvested Main Season and Grown on a Sandy Loam Soil at the Snyder Agricultural Research & Extension Farm near Pittstown, NJ - 1998.

Variety Name	Seed Source (1)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r		% Culls	% Tuber Sizes (2)				
			cwt/a	% of Sup.		4 oz	8 oz		1	2	3	4	5
Norkotah 8	ne	522	433	164	1.077	95	74	13	5	21	22	21	32
Norkotah 3	ne	522	417	158	1.084	91	68	13	9	23	30	26	12
A84180-8	ne	516	390	148	1.082	85	59	11	15	26	30	20	8
Century	ne	469	363	138	1.086	86	65	9	14	20	29	20	16
B1409- 2	cf	389	323	122	1.087	91	65	8	9	26	30	19	17
A86102-6	ne	436	297	112	1.086	75	33	9	25	42	22	8	3
Norkotah	ne	370	285	108	1.080	84	49	8	16	35	30	13	6
B9922-11	cf	325	278	105	1.086	91	63	6	9	28	33	24	5
Superior	ne	303	264	100	1.086	90	42	3	10	48	33	7	3
A84118-3	ne	311	246	93	1.089	83	39	5	17	44	29	9	1
CO83008-1	ne	167	135	51	1.078	86	30	5	14	57	26	4	0
CV (3)		13	15		.356	5	16						
W-D Bayes LSD.05		67	63		.006	6	11	ns	6	10	ns	6	7

(1) cf = USDA Chapman Farm and ne = Northeast Regional Project.

(2) Size 1 = Under 4 oz, S2 = 4 to 8 oz, S3 = 8 to 12 oz, S4 = 12 to 16 oz, and S5 = Over 16 oz.

(3) CV=Coef of Variation; W-D Bayes LSD.05=Waller Duncan Test For Least Significant Difference.

Russet Norkotah 8 is a selection of Russet Norkotah that yielded very well with very large attractive russetted tubers. It had few defects. It is late maturing and had 5 out of 40 with hollow heart. This selection may have a use for direct marketers.

New Jersey Table 12. Plant and Tuber Characteristics, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings in Variety Table 11 (1).

Variety	PLANT		TUBER CHARACTERS							TUBER DEFECTS (2)							OVER			
	P	A	M	S	C	T	S	D	T	S	G	H	S	B	H	H	N	R	ALL	Comments
Norkotah 8	8	9	6	9	5	4	8	6	7	7	8	9	9	9	5	2	6		yes	best one
Norkotah 3	8	9	6	9	5	3	8	5	6	6	9	7	9	9	11	2	7		yes	some misshapen
A84180-8	8	9	5	9	5	4	9	6	5	5	7	7	9	9	6	1	7		no	app- defects
Century	7	9	6	9	7	7	8	6	5	5	7	7	9	9	0	0		ok	no russetting	
B1409- 2	6	9	4	9	5	4	6	6	5	5	8	9	9	9	1	1	7		no	poor app
A86102-6	8	9	4	9	5	4	7	7	6	6	9	7	9	9	9	0		yes	like RB	
Norkotah	6	7	5	8	5	4	8	7	7	7	7	8	9	9	2	2	7		yes	nice
B9922-11	6	8	6	9	5	4	7	6	6	6	9	8	9	9	12	29	5		ok	not many nice
Superior	7	9	3	9	7	7	5	5	7	7	8	8	9	9	1	2	6		std	poor app
A84118-3	8	9	5	9	5	6	5	5	5	5	8	9	9	9	4	0		no	many rd	
C083008-1	5	5	3	8	5	4	6	6	5	5	7	9	9	9	1	0		no	y- app-	

(1) See New Jersey Rating Table on back cover for abbreviations and ratings for plant and tuber characteristics, tubers defects, chip color and comments.

(2) HH = No. of Hollow Heart tubers out of 40. HN = No. of Heat Necrosis tubers out of 40 cut.

New Jersey Table 13.

Yields, Specific Gravities, and Tuber Sizes for 17 Round Potato Varieties, Harvested Late Season and Grown on a Silt Loam Soil at the Snyder Agricultural Research & Extension Farm near Pittstown, NJ - 1998.

Variety Name	Seed Source (1)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (2)				
			cwt/a	% of Sup.		1	7/8	2 ½		1	2	3	4	5
All Blue	cf	537	421	106	1.087	78		20	6	16	58	16	4	0
Blue Mac	cf	620	509	128	1.082	82		53	12	6	29	41	13	0
Itasca	ne	474	415	104	1.078	87		54	9	3	33	41	13	0
Niska	ne	434	317	80	1.087	73		54	24	3	20	37	17	0
AtBt 4-31	ny	539	467	117	1.112	87		64	7	6	22	33	26	5
AtBt 4-36	ny	496	464	117	1.102	94		73	3	3	21	39	34	0
B0852- 7	cf	353	319	80	1.093	90		60	1	9	30	37	23	0
B1240- 1	cf	696	617	155	1.099	89		74	8	4	14	38	37	0
B1425- 9	cf	428	369	93	1.089	86		51	6	7	35	45	6	0
B1429-A3	cf	369	351	88	1.089	95		55	0	5	40	46	9	0
B1440-18	cf	337	283	71	1.094	84		53	13	3	31	34	19	0
B1491- 5	cf	292	257	64	1.077	88		53	3	9	35	41	12	0
B1492-12	cf	550	461	116	1.081	84		18	0	16	65	18	0	0
B1521- 2	cf	364	313	79	1.077	86		31	1	13	55	29	2	0
B1523- 4	cf	285	181	46	1.086	64		41	27	10	23	24	17	0
B1524- 2	cf	285	181	46	1.086	64		41	27	10	23	24	17	0
B1526- 1	cf	501	426	107	1.083	85		43	3	12	42	34	9	0
B1529- 1	cf	524	445	112	1.085	85		57	9	6	28	27	26	4
B1749-15	cf	432	355	89	1.099	82		72	15	3	10	33	39	0
B1752- 5	cf	411	357	90	1.077	87		50	5	8	37	39	11	0
B1758- 3	cf	519	410	103	1.075	79		43	12	9	36	37	6	0
B1761- 1	cf	308	250	63	1.067	81		44	11	7	37	30	13	0
B1763- 4	cf	479	447	112	-	93		59	3	4	35	42	17	0
B1763- 5	cf	278	242	61	1.091	87		31	0	13	56	28	3	0
BD113- 3	cf	122	57	14	1.085	47		0	0	53	47	0	0	0
BD146- 4	cf	-	-	-	1.102	-		-	-	-	-	-	-	-

New Jersey Table 13. (Continued.)

Variety Name	Seed Source (1)	Total Yield cwt/a	Market Yield % of Sup.	Spec. Grav.	% Over			% Culls	% Tuber Sizes (2)				
					1	7/8	2 1/2		1	2	3	4	5
NY 112	ny	635	601	1.091	95	71		2	3	24	46	24	1
NY 121	ny	481	442	1.097	92	65		4	4	27	46	19	0
NY 122	ny	513	443	1.088	86	61		8	5	25	35	23	3
NY R17-19	ny	411	400	1.082	97	78		2	1	19	38	37	2
NY R17-11	ny	360	344	1.094	96	42		0	4	54	33	9	0
NY S 3-1	ny	331	283	1.083	86	70		13	1	15	37	30	3
NY S 4-2	ny	394	384	1.078	97	78		1	2	19	37	32	9
NY S 4-3	ny	355	340	1.087	96	57		0	4	39	52	6	0
NY S 14-2	ny	470	459	1.100	98	75		1	2	22	45	30	0
NY S 26-2	ny	458	414	1.078	90	70		6	3	20	40	29	1
NY S 27-2	ny	422	385	1.081	91	68		6	3	24	31	34	2
NY S 28-2	ny	502	470	1.081	94	60		2	4	34	43	17	0
NY S 31-1	ny	534	472	1.069	88	68		6	5	20	27	41	0
NY S 31-3	ny	788	626	1.066	80	72		19	1	7	19	49	4
NY S 31-7	ny	402	382	1.086	95	78		2	3	17	42	34	2
NY S 32-2	ny	510	499	1.101	98	80		1	2	18	46	33	1
NY S 32-3	ny	253	241	1.088	95	77		4	1	18	47	30	0
NY S 33-5	ny	367	364	1.089	99	73		0	1	26	50	23	0
NY S106-17	ny	423	407	1.091	96	73		3	1	23	42	31	0
NY S300-1	ny	294	267	1.099	91	55		4	5	36	37	18	0
NY S300-7	ny	361	334	1.091	93	72		6	2	21	41	30	0
NY S300-9	ny	180	180	1.094	100	95		0	0	5	16	65	14
NY S300-13	ny	392	376	1.096	96	76		2	2	20	45	31	0

(1) cf = USDA Chapman Farm, ne = Northeast Regional Project, ny = Cornell University.

(2) Size 1= Under 1 7/8, S2= 1 7/8 TO 2 1/2, S3= 2 1/2 to 3 1/4, S4= 3 1/4 TO 4, and S5= Over 4.

New Jersey Table 14. Plant and Tuber Characteristics, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings in Variety Table 13 (1).

Variety	PLANT			TUBER CHARACTERS							TUBER DEFECTS(2)							Comments		
	P	A	A p	M	S	C	T	S	D	T	S	G	H	S	B	H	N		R	OVER ALL
All Blue	9	9		4	7	1	6	5	5	5	5	5	9	9	9	0	0		no	purple flesh
Blue Mac	9	9		7	8	1	8	4	7	5		2	8	9	9	0	7	6	no	pale purple
Itasca	8	9		6	8	8	8	3	4	5		8	7	9	9	0	0	no	app- y+	
Niska	8	9		5	9	8	8	3	5	3		6	3	9	9	0	3	7	no	gc sg gr app-
B0852- 7	7	9		4		1	8	2	5	7						0	3	7	ok+	big purple y-
B1240- 1	7	9		9	5	8	7	3	8	8		8	6	9	9	1	2	7	yes	
B1425- 9	8	9		3	9	7	7	2	8	6		9	9	9	9	0	0		ok	so-so
B1429-A3	6	8		3	9	7	6	3	5	6		9	9	9	9	0	0		ok	
B1440-18	7	9		2	8	8	8	3	6	6		9	6	9	9	1	0		no	y-
B1491- 5	7	7		3	7	2	8	3	6	6		9	8	9	9	0	1	7	no	y- good red color
B1492-12	8	9		5	8	2	8	2	6	8		6	8	9	9	0	0		yes	app+ y+
B1521- 2	8	9		4	8	2	7	2	8	8		9	8	9	9	0	0		ok+	app+ y-
B1523- 4	6	6		4	7	2	7	2	7	6		8	3	9	7	0	0		no	gc app-
B1524- 2	8	9		5	8	2	7	2	6	6		8	9	9	9	0	5	5	no	hn y-
B1526- 1	9	9		8	6	2	6	2	6	6		6	8	6	9	0	0		no	y-
B1529- 1	9	9		6	5	1	8	3	6	5		6	4	9	9	0	0		no	gc sg ac
B1749-15	8	9		4	8	8	8	3	7	5		6	8	9	9	0	8	6	no	hn
B1752- 5	7	9		4	8	6	8	2	6	7		7	9	9	7	0	6	6	no	hn
B1758- 3	7	7		5	6	2	8	2	6	7		8	6	9	9	0	0		yes	red
B1761- 1	4	5		3	5	1	7	4	6	6		8	7	9	9	0	2	7	no	rot gc
B1763- 4	6	6		2	5	1	8	3	6	8		9	7	9	9	0	2	7	yes	nice purple
B1763- 5	7	9		4	8	2	6	4	6	6		9	8	9	9	0	0		no	y-
BD113- 3	6	7		2	9		8	8	2	5	1	1	9	1	9	0	9	3	no	bad hn
BD146- 4	6	7		1	9		4	6	3				9	9		0	0		ok+	best orange fl

New Jersey Table 14. (Continued.)

Variety	PLANT			TUBER CHARACTERS								TUBER DEFECTS(2)								Comments
	P	A	M	S	C	T	S	D	T	S	G	H	S	B	H	N	R	OVER ALL		
NY 112	7	9	6	8	6	7	2	5	8	9	9	9	9	9	0	1	7	yes	Y++	
NY 121	7	8	4	7	8	7	3	7	6	9	9	9	7	0	6	6		no	hn	
NY 122	7	8	6	8	8	8	4	2	5	8	9	9	9	0	0			ok	app-	
NY R17- 11	7	8	4	8	7	8	2	7	7	9	9	9	9	0	0			ok	so-so	
NY R17- 19	7	8	4	8	7	8	2	7	7	9	9	9	9	0	0			yes	nice	
NY S 3- 1	6	8	5	8	7	6	2	8	7	9	5	9	9	9	0	8	7	no	Y-	
NY S 4- 2	7	9	5	9	7	7	2	6	7	9	9	9	9	0	0			ok+	ok	
NY S 4- 3	7	9	4	8	7	8	2	5	6	9	9	9	9	0	0			ok	so-so	
NY S 14- 2	7	8	6	8	6	7	2	7	5	9	9	9	9	0	0			yes	Y+ app-	
NY S 26- 2	6	9	4	8	8	7	2	7	7	9	7	9	9	9	0	0		yes	Y+	
NY S 27- 2	7	9	5	8	6	6	3	7	6	7	7	7	9	9	0	2	7	ok	so-so	
NY S 28- 2	6	9	6	8	8	7	4	5	7	8	8	9	9	0	0			ok+	Y+	
NY S 31- 1	7	9	6	8	8	8	3	5	7	8	8	7	9	0	0			yes	Y+ SG-	
NY S 31- 3	7	9	7	5	8	8	2	5	5	5	7	9	9	0	0			yes	app- Y++	
NY S 31- 7	5	9	4	8	8	7	2	8	8	9	9	9	9	0	2	7		yes	Y+ app+	
NY S 32- 2	5	9	6	8	8	7	2	7	7	9	8	7	7	1	0			yes	Y+	
NY S 32- 3	6	9	5	8	7	6	2	6	8	9	9	9	9	0	4	6		no	hn Y-	
NY S 33- 5	7	8	3	9	7	8	2	7	7	9	9	9	9	1	0			ok+		
NY S106-17	6	8	4	8	8	8	2	8	7	9	9	9	9	0	1	7		yes	nice	
NY S300- 1	5	9	5	8	7	7	3	4	6	7	9	9	9	9	0	1	7	no	app- sg	
NY S300- 7	6	9	5	8	8	8	2	7	7	9	9	9	9	0	1	7		no	bright white	
NY S300- 9	6	9	6	8	8	7	2	8	8	9	9	9	9	0	0			no	Y-	
NY S300-13	7	9	6	8	7	8	2	3	5	9	9	9	9	0	0			no	app-	

(1) See New Jersey Rating Table on back cover for abbreviations and ratings for plant and tuber characteristics, tubers defects, chip color and comments.

(2) HH = No. of Hollow Heart tubers out of 10. HN = No. of Heat Necrosis tubers out of 10 cut.

New Jersey Table 15.

Yields, Specific Gravities, and Tuber Sizes for 9 Russet Potatoes Seedlings, Harvested Main Season and Grown on a Silt Loam Soil at the Snyder Agricultural Research & Extension Farm near Pittstown, NJ - 1998.

Variety Name	Seed Source (1)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (2)				
			cwt/a	% Sup.		4 oz	8 oz	1		2	3	4	5	
AF1156-14	me	250	131	50	1.089	52	39	31	16	14	19	14	6	
B1463- 1	cf	243	187	71	1.091	77	54	14	9	23	40	14	0	
B1463-12	cf	471	279	106	1.087	59	34	20	21	25	20	15	0	
B1730- 4	cf	261	118	45	1.088	45	15	14	41	30	12	2	0	
B1730-22	cf	326	235	89	1.089	72	32	7	21	40	23	9	0	
B1730-30	cf	317	264	100	1.080	83	33	7	10	50	30	3	0	
B1739- 1	cf	259	196	74	1.099	76	35	17	7	41	27	8	0	
B1739- 3	cf	147	87	33	1.078	59	8	7	34	51	8	0	0	
B1746- 4	cf	225	147	56	1.097	65	18	6	29	47	18	0	0	

(1) cf = USDA Chapman Farm and me = University of Maine.

(2) Size 1 = Under 4 oz, S2 = 4 to 8 oz, S3 = 8 to 12 oz, S4 = 12 to 16 oz, and S5 = Over 16 oz.

New Jersey Table 16.

Plant and Tuber Characteristics, Tuber Defects, Chip Color and Overall Rating for Varieties and Seedlings in Variety Table 15 (1).

Variety	PLANT			TUBER CHARACTERS				TUBER DEFECTS(2)										Comments
	P	A	M	S	C	T	S	D	T	S	G	H	S	B	H	N	R	
	a	p	t	S	l	x	h	p	a	G	C	S	B	H	N	R	ALL	
AF1156-14	6	9	3	9	8	6	6	6	4	5	9	6	9	0	0	0	no	app- sg hs
B1463- 1	6	9	3	9	7	5	6	6	6	9	6	9	9	1	0	0	no	y- gc
B1463-12	7	9	2	9	8	8	7	7	5	6	9	9	9	1	0	0	no	sg y- gr
B1730- 4	6	9	2	9	5	6	6	7	6	6	7	9	9	0	1	7	no	s- sg y-
B1730-22	6	8	2	9	8	6	7	7	7	8	8	6	9	0	0	0	no	hs gr
B1730-30	7	8	2	9	5	4	7	6	6	9	9	9	9	3	6	6	no	app- hn
B1739- 1	6	8	4	9	5	4	7	5	6	9	9	9	9	0	6	6	no	y- hn
B1739- 3	4	6	1	9	8	7	6	7	6	9	9	9	9	0	1	7	no	y-
B1746- 4	7	9	2	9	8	7	6	6	6	9	6	9	9	0	0	0	no	y- gc

(1) See New Jersey Rating Table on back cover for abbreviations and ratings for plant and tuber characteristics, tubers defects, chip color and comments.

(2) HH = No. of Hollow Heart tubers out of 10. HN = No. of Heat Necrosis tubers out of 10 cut.

New Jersey Rating Table. Abbreviations and Ratings for Plant and
Tuber Characteristics, Tuber Defects,
Chip Color, and Comments.

<u>Plant</u>		<u>Air</u>		<u>Vine</u>	
<u>Pa = Appearance</u>		<u>Ap = Pollution</u>		<u>Mt = Maturity</u>	<u>SS = Skin Set</u>
1 = Very poor		1 = Dead		1 = Very Early	1 = None left
2 =		2 =		2 = Early	2 =
3 = Poor		3 = Mod. Defol		3 =	3 = most gone
4 =		4 =		4 = Med Early	4 =
5 = Fair		5 = Mod Injury		5 = Medium	5 = half left
6 =		6 =		6 = Med Late	6 =
7 = Good		7 = Mild Injury		7 =	7 = most left
8 =		8 =		8 = Late	8 =
9 = Excellent		9 = No Symptoms		9 = Very Late	9 = All left

<u>Tuber</u>		<u>Tuber</u>	
<u>Cl = Color</u>		<u>Tx = Texture</u>	<u>Dp = Depth</u>
1 = Purple		1 = Part Rus	1 = V. Flat
2 = Red		2 = Heavy Rus	2 =
3 = Pink		3 = Mod. Rus	3 = Flat
4 = Dark Br.		4 = Light Rus	4 =
5 = Brown		5 = Netted	5 = Acceptable
6 = Tan		6 = Sl. Netted	6 =
7 = buff		7 = Mod. Smooth	7 = Good
8 = White		8 = Smooth	8 =
9 = Br. White		9 = V. Smooth	9 = V. Round

<u>Tuber</u>		<u>Rating for</u>	
<u>Ta = Appearance</u>	<u>Tuber Defects</u>	<u>Tuber Defects</u>	<u>CC = Chip Color</u>
1 = Very Poor	SG = Second Growth	1 = 100%	1 = Paper white
2 =	GC = Growth Cracks	2 = 76 to 99%	2 =
3 = Poor	HS = Heat sprouts	3 = 51 to 75%	3 =
4 =	SB = Scab	4 = 26 to 50%	4 = Acceptable
5 = Fair		5 = 11 to 25%	5 = Borderline
6 =		6 = 6 to 10%	6 = Unacceptable
7 = Good		7 = 3 to 5%	7 =
8 =		8 = 1 to 2%	8 =
9 = Excellent		9 = none	9 = Black Chip

<u>Abbreviations</u>		<u>Comments</u>
HH = No. of Hollow Heart Tubers		hn = heat necrosis
HN = No. of Heat Necrosis Tubers		hh = hollow heart
<u>R = Heat Necrosis rating</u>		bc = brown center
1 = Very Severe		y = yield
2 =		s = size
3 = Severe		app = tuber appearance
4 =		ch = chip color
5 = Unacceptable		gc = growth cracks
6 = Borderline ok		SG = specific gravity
7 = Slight		sg = second growth
8 = Very Slight		sb = scab
9 = none		

New York

R.L. Plaisted, B.B. Brodie, D.E. Halseth, S.A. Slack, W.M. Tingey, and K.D. Paddock

Early Generations

The crossing program produced 37 round white combinations with chipping and tablestock potential, 5 red combinations, 24 trichome hybrids, and 15 segregating for resistance to late. Twelve combinations segregate for resistance to two or more races of *Globodera rostochiensis*.

Seeds produced in 1996 (W's) were sown and the seedlings were transplanted to six inch pots. Four tubers were saved from each, after selecting for tuber color in the trichome and red progenies. There were 8700 round whites, 4098 with trichomes, and 1601 neotuberosum clones with blight resistance.

The four hill seedling populations (V's) started with 9567 round whites. At harvest 719 were selected for tuber type, then stored until testing for resistance to the golden nematode. There were 208 selections from 2663 segregating for Ro2 race of golden nematode.

The 3943 trichome clones were selected for tuber type at harvest, then resistance to the golden nematode. There were 348 saved. The 1902 clones bred for resistance to late blight produced 208 selections.

The third year generation (U's) consisted of 762 clones in 24 hill plots. At harvest 142 were saved and the following winter evaluations were made for chip color, specific gravity, and golden nematode resistance.

Intermediate Generations

The fourth year selections (T's) were grown as 100 hill plots for seed production and selection and in two row by 20-foot plots for observation and chip samples. From the 156 that were grown, 50 have survived the fall selection and post harvest tests.

The fifth generation (S's) were grown in 400 hill seed plots and a replicated yield trial. The 38 at this stage of selection were reduced to 9. Five are round white clones and 4 are trichome clones.

Advanced Generations

A summary of the performance of the most advanced clones is as follows:

NY101 = K7-1 = Steuben x Norwis (1986).

Mid-late season tablestock. Pale yellow flesh. Scurfy skin. Exceptionally high yields of large round tubers. Yield at Harford and Ellis Hollow for eight seasons has been 112% of Atlantic. At four sites in 1995, NY101 yielded 114% of Atlantic and at two sites was 151% of Katahdin. At four sites in 1996, the yield was 124% of Atlantic. At six sites in 1997, the yield was 123% of Atlantic. At three sites in 1998, the yield was 129% of Atlantic. The average for 17 trials was 122% of Atlantic. Early sizing. Large tuber size. Very round. Very few pickouts. Prominent lenticels were noted in two Ithaca trials in 1998. Internal necrosis has been observed frequently in Long Island trials, in two Ithaca trials in 1995, in the Harford trial in 1997, and averaged 24% in three Ithaca trials in 1998, compared to 8% for Atlantic. Scab resistance like Superior. Specific gravity like Katahdin. Very nice vine growth and appearance. Resistant to golden nematode. This clone is exceptional for its high yield of spherical tubers. It has good eating quality and the pale yellow flesh may influence its marketability. The scurfy skin and occasionally prominent lenticels in freshly harvested tubers may be a detraction. On sites where internal necrosis is a recurring problem, this factor needs consideration. Grower reaction is essential on this clone.

NY103 = K88-24 = Steuben x (Neotbr x tbr)

(1986). Midseason tablestock. Yield of US #1 relative to Atlantic was 91% at five upstate sites in 1993 and was 118% at seven upstate sites in 1994, 114% at six sites in 1995, 110% at six sites in 1996, 96% at six sites in 1997, and 105% at five sites in 1998. The average of 35 tests is 106%. In five years at Riverhead, NY103 yielded 107% of Katahdin. Some evidence that spacing narrower than 9.3" might be an advantage. Outstanding tuber appearance. Very bright, blemish-free skin. Round to oval shape. Shallow eyes. Generally medium sized tubers, but in 1998 were large in most trials. Almost free of pickouts and internal defects. Scab resistance like Monona. Tuber dormancy seven weeks longer than Katahdin and Monona. Nice vine type. Specific gravity is .014 less than Atlantic (39 trials, 6 years). In 1994, after 45° storage, the Agtron for chips of NY103 was 54 compared with 55 for Monona, and in

1995, the Agtron for NY103 and Snowden were both 60. In 1996, the Agtron score for NY103 was 49, Monona was 40, and Snowden was 53. In 1997, the chip score for NY103 was 3.5 compared to 1.8 for Monona and 1.2 for Snowden. Some after-cooking darkening. Resistant to the golden nematode, PVX, and PVY. May not perform as well on muck soils as upland soils. There is some indication this clone may have better than average drought tolerance. This clone has special merit for the tablestock industry. The uniform shape, shallow eyes, and bright, blemish-free skin make this a very attractive potato. The exceptionally long tuber dormancy adds further to its merit.

NY112 (P7-19) = Atlantic x Q155-3 (1990). Late maturity chipstock. Very scurfy skin texture, but attractive round shape. Outstanding yield. In five upstate trials in 1996, the marketable yield was 128% of Atlantic. In six upstate trials in 1997, the marketable yield was 117% of Atlantic. In five upstate trials in 1998 the marketable yield was 117% of Atlantic. The average for the past three years (16 trials) has been 120% of Atlantic. In 1998, the yield was 106% of Katahdin at Riverhead. In three years, the early season yield was 103% of Superior. Large tuber size. May benefit from closer than 9.3" spacing. Generally free of pickouts due to external defects. There has been a small percentage of internal defects, primarily hollow heart, but less than in Atlantic. The chip color score from 45° storage at Ithaca in 1997 was 2.5 (6 trials) compared to 3.3 for Monona and 1.5 for Snowden. The scores from Wyoming and Steuben County were 3.6 for NY112 and 2.6 for Snowden. The average Agtron scores for two locations and three dates in 1996 and 1997 was 52 for NY112, 50 for Monona, and 53 for Snowden. Specific gravity is .008 less than Atlantic (20 trials), .012 greater than Monona. Large vines. White flowers. Golden nematode resistant. Scab resistance like Superior.

NY115 (P23-31) = Pike x NY88 (1990). Medium maturity chipstock and tablestock. Very large tuber size. Early sizing. Small tuber number per plant. Attractive, very bright tubers. Marketable yields in upstate trials in five years were 92% of Atlantic. Early harvest yields in three years were 104% of Superior. The marketable yield in 1997 was 82% of Atlantic at 3 Tompkins County trials, 92% of Atlantic in Steuben and Wyoming Counties and 86% of Katahdin at Riverhead. In 1998, the yield was 83% of Atlantic at 3 Tompkins County trials, 92% of

Atlantic in Steuben and Wyoming Counties. In 1998 at Ithaca, a 6" spacing produced an 11% increase in yield over a 9" spacing (87% of Atlantic). The average tuber weight was reduced by only 0.6 oz. and the number of tubers per foot of row was increased by 1.4. Generally free of pickouts and internal defects. Scab resistance like Atlantic. Golden nematode resistant. White flowers. Attractive vine. Specific gravity is .011 less than Atlantic (18 trials, 3 years). Chip color score from two locations at three dates from 45° storage for NY115 was 1.9 (Agtron=57) for 1996 crop and 2.0 (Agtron=53) for 1997 crop. The score for Monona was 5.2 (Agtron=46) and 3.0 (Agtron=53) for Snowden from the 1996 crop; and 4.0 (Agtron=53) for Monona and 1.5 (Agtron=53) for Snowden from the 1997 crop. Tuber flesh stays white after boiling. Very good tuber appearance and chip color justify further spacing trials to improve yield performance.

NY118 (P49-19R) = D191-103 x Chieftain (1990). Late season, light red tablestock. Marketable yields at Ellis Hollow and Harford in 1996 and 1997 were 91% of Chieftain. At Freeville in 1997, the yield was 101% of Chieftain. In 1998, the yield was 96% of Chieftain at Ellis Hollow, 97% at Harford, 94% at Riverhead, and 100% at Freeville. Tuber set and size of NY118 and Chieftain are similar. Few misshapen tubers and free of internal defects. Attractive, oval shape. Skin is slightly textured and resists skinning. Eyes are sparse and very shallow. The intensity of color is similar to that of Chieftain. Flesh color is bright white before and after boiling. Specific gravity is .004 less than Chieftain (4 trials). Tuber dormancy is 4 weeks longer than Chieftain. Better scab resistance than Chieftain. Resistant to race Ro1 of the golden nematode.

NY120 (Q8-2) = Kanona x AF186-2 (1991). Mid-late season chipstock. Marketable yields at Ellis Hollow and Harford in 1996 and 1997 were 104% of Atlantic. In three other NY trials in 1997, the yield was 123% of Atlantic. In 1998 NY120 yielded 102% of Atlantic in 3 Tompkins County trials and 111% of Atlantic in Steuben and Wyoming Counties. In 12 trials (3 years) the average has been 109% of Atlantic. In the Ellis Hollow spacing trial, NY120 was especially responsive to closer spacing. At 6" it yielded 16% more than at 9". Early harvest yield in 1997 and 1998 was 101% of Superior. In seven trials in 1997 and 1998, NY120 at 9" spacing averaged 7.1 tubers per foot compared to 8.2 for Atlantic and

weighed 7.0 oz. compared to 6.1 for Atlantic. In the Ellis Hollow spacing trial, the 6" spacing reduced tuber size by only 0.3 oz., and increased tuber number per foot of row by 1.5. Generally few pickouts and free of internal necrosis and hollow heart. Very nice vine type. Tubers have a very scurfy skin texture. Specific gravity is .002 less than Atlantic (15 trials). Chip color from 45° has been better than Monona. Tuber dormancy has been two weeks shorter than Atlantic. Scab resistance is between Superior and Monona. Resistant to race Ro1 of the golden nematode. Looks promising for chipstock. It appears that with spacing closer than 9", this clone has considerable promise for the chipstock industry.

NY121 (Q237-25) = N43-288 x E74-7 (1991).

Mid-late season tablestock. Bright white skin. This clone has resistance to late blight, and to four races of the cyst nematode Ro1, Ro2, P4A, and P5A. It appears to be resistant to PVY and scab. In a single trial in Ellis Hollow in 1997 it produced a marketable yield 87% of Atlantic. In two trials in Tompkins County in 1998 it yielded 70% of Atlantic. At Riverhead it yielded 65% of Katahdin. Tuber size is small. It had almost no internal or external defects. The specific gravity was .006 less than Atlantic. Scab reaction is like Monona. The primary value of this clone is its resistance to several races of cyst nematode and to late blight. It has produced several good selections with good chip color and high specific gravity in crosses in the "U" generation.

NY123 (R127-19) = M504-2 x L227-243 (1992).

Medium-late maturity tablestock. Bright white skin. This clone combines good trichome features with attractive tuber shape and good agronomic performance. In a single trial in Ellis Hollow in 1997, it produced a marketable yield 99% of Atlantic. There were few pickouts and no internal defects. The specific gravity is .006 less than Atlantic (2 trials). At Freeville, in plots protected by insecticide, NY123 yielded 95% of Allegany. In adjacent plots without protection from insecticides NY123 suffered only 14% yield reduction whereas Allegany suffered 70% yield reduction. Three year's data show only 11% yield reduction due to Colorado potato beetles in unprotected plots and no visible leaf hopper damage. In 1998, NY123 was in one unreplicated observation plot where it had a satisfactory appearance, but yielded less than Atlantic and other checks. In a replicated trial at Freeville when protected with insecticide it yielded 92% of

Atlantic. In adjacent plots not protected by insecticide, NY123 suffered only 5% yield reduction whereas Atlantic suffered a 25% reduction. This clone is resistant to race Ro1 of the golden nematode and probably to PVY. Scab reaction is between Atlantic and Katahdin.

Long Island, New York

J.B. Sieczka, D.M. Gergela, R.C. Neese, and D.D. Moyer

Introduction: Experiments conducted in 1998 are part of an ongoing program evaluating promising potato clones under Long Island conditions. Fifty-eight potato clones were evaluated in replicated experiments conducted at the Long Island Horticultural Research Laboratory (LIHRL). In addition, 62 clones were included in an observation trial.

Methods: The randomized complete block design with four replications was used in most experiments. Variety plot size was two rows by 12 feet. In experiments where N rate was not a variable, fertilizer was applied at a rate of 1,000 lbs/A of 10-20-20 in bands at time of planting. An additional 60 lbs N/A were applied when plants were 4 to 6 inches tall. Seed spacing was 9.3 inches in all experiments. Specific gravity was determined by the hydrometer method. Internal defects were determined on ten 3.25 to 4 inch tubers per replication. Tables include information on planting, vine kill and harvests dates, maturity ratings, tuber appearance and shape.

Experiments to determine the effect of nitrogen rate on yield and quality of NY103, NY110 and NY115 were established on 4/13/98. Plot size was 4 rows x 20 feet long with the center two rows x 15 feet used for data. All plots were fertilized at a rate of 200 lbs/A of phosphate and potash plus either 40, 90, 140 or 190 lbs N/A in bands at planting. Sixty pounds N/A were side-dressed on 6/9/98.

Early white-skinned clones: The highest total and marketable yields were produced

by Superior, Reba, and AF1470-6. Tubers of Reba and AF1470-6 were relatively attractive, but a high percentage of AF1470-6 tubers had internal necrosis. Monona tubers also had internal necrosis. Specific gravity of Superior, Andover, and NY110 were the highest in the experiment.

NE184 white-skinned clones: Highest total yields were produced by Allegany, Kennebec, B0766-3, and NY103. The highest marketable yields were produced by Allegany, AF1437-1, AF1475-20, B0766-3, and NY103. Atlantic had the highest specific gravity, followed by Yukon Gold, AF1615-1, and B0766-3. AF1437-1 had the lowest specific gravity. The best appearing lines were Reba, AF1615-1, and NY103. Many clones had internal necrosis. The lines that were relatively free from internal defects included Allegany, AF1437-1, AF1606-8, AF1615-2, and B0564-8.

White-skinned USDA clones: the highest total yields were produced by Katahdin and B0178-34. Highest marketable yields were produced by Katahdin, Norwis, and B0178-34. B0178-34 had the highest specific gravity. Most of the clones tested had a significant amount of internal defects. Those relatively free of internal defects were B0564-8, B1429A-3, and B1478-8.

White-skinned Cornell University clones: Lines that produced the highest total yields were Katahdin, NY101, NY112, R6-4, R17-7, and R41-11. The highest marketable yields were produced by Katahdin, NY112, and R17-7. Tubers of NY115 were the most attractive. Other lines with attractive tubers were NY103, NY110, R17-2, R17-11, and R17-19. NY119 had the highest specific gravity. Lines with significant amounts of internal necrosis were Katahdin, NY101, and R41-11.

Red-skinned clones: Chieftain and NY118 produced the highest total and marketable yields. The other lines tested had relatively low yields of marketable tubers. Redsen tubers were by far the most attractive with a very dark red skin and shallow eyes. Another line that was relatively attractive was B1145-2. Chieftain had some internal necrosis. B0811-13 and B0852-7 had brown center problems.

Observation trial: Data from a non-replicated trial on yield, appearance, specific gravity and internal defects of early selection clones and recently released varieties are presented in Long Island Table 15.

Transgenic evaluation: The transgenic line Superior New Leaf Y (259) had similar horticultural characteristics to the standard Superior variety. The transgenic line has resistance to Colorado potato beetle (CPB) and potato virus Y. Yield, tuber appearance, and internal and external quality of the two lines were very similar.

Diploid clones: Five diploid clones were evaluated under Long Island conditions. The yields were low and all had heat sprouts and were irregularly shaped. BD132-2 was the smoothest of the lines tested. BD146-4 had considerable hollow heart even though the potatoes were relatively small. All lines produced tubers with yellow flesh that were generally mealy in texture.

NY clones x N rate: The effect of four nitrogen rates on yield and quality of NY103, NY110 and NY115 were evaluated. The rates were 100, 150, 200 and 250 lbs N/A. There were no significant differences in yield and specific gravity among N rates in NY103 and NY110. The 100 lbs N/A rate resulted in the lowest yield for NY115.

Rates above 150 lbs N/A were not significantly different from each other.

Storage results: After-cooking darkening and blackspot ratings for clones grown in 1997 are given in Long Island Table 22.

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Long Island Table 1. Tuber characteristics of potato clones grown on Long Island, N.Y.

CLONE	Table	Color	Texture	Shape	Depth	Eye Depth		Appearance	Comments
						Lateral	Apical		
Allegany	4,5	Bu	SN	R-O	MT	S	D	6	Irr
Andover	2,3	Bu	SN	O-R	MT	MS	MS	7	SI Irr
Atlantic	4,5	Bu	N	R-O	MT-R	S	MD	6	SI Irr, internal defects
Carla	6,7	Y-W	RS	O	R	S	S	6	SI kidney shape
Chieftain	10,11	LR-Pi	RS	O-R	MT	MS	MS	6	St, Sk
Dark Red Norland	10,11	LR-Pi	SN	O-R	MT	MS	MS	6	Light color
Katahdin	4,5,6,7,8,9	W-Bu	RS	O-R	MT-SF	S	MD	6	Irr, St, Internal defects
Kennebec	4,5	W	RS	O	SF	S	MD	3	Irr, Ugly
Monona	2,3	W	SN	O	SF	MD	MD	5	Irr, Sm, Internal defects
Norwis	4,5,6,7	W	S-RS	O	SF	MS-MD	MD-D	5-6	Irr
Reba	2,3,4,5	W-Bu	RS	O-R	MT	MS	MD	7	SI Irr
Redsen	10,11	DR	S	R-O	R	S	S	8	Okay, Sk
Rideau	10,11	Pi-LR	S-RS	O	SF	MS-MD	MS-MD	5	Irr, St, Sk
Superior	2,3,12	Bu	SN	O-R	SF-MT	MD	MD-D	5-6	Irr
Superior 259	12	BU	SN	R-O	MT	MD	MD	6	Irr
Yukon Gold	4,5	W-Y	RS	O	MT	S	MD	6	SI Irr, Pi buds
AF1437-1	4,5	Bu	S-SN	R-O	MT	S	MS-D	5	Irr
AF1470-6	2,3	W	RS	R-O	MT	S	MS	7	Internal defects
AF1475-20	4,5	Bu	N-SN	R-O	MT	S-MD	MD	5	Irr
AF1565-12	2,3	W	S	O-R	MT-SF	MS	MS	5	Irr, Lumpy
AF1606-8	4,5	Bu	N-SN	R-O	MT	S-MS	MD	4	Irr, Lumpy, Sp
AF1615-1	4,5	W	RS	O-R	MT	S	MS	7	SI Irr, some Ct
B0178-34	6,7	Bu	RS	O-R	SF-MT	S-MS	MS	6	Irr, Sp
B0564-8	4,5,6,7	Bu	N-SN	R-O	MT	S-MD	MD	5-6	Irr, Star crack
B0564-9	6,7	Bu	SN	R	R-MT	S	MS	6	Irr, Sp
B0766-3	4,5,6,7	Bu	N-SN	R-O	R-MT	S-MS	MS-D	5	Irr, Sp, Ct
B0811-4	10,11	Pi-LR	S	R	R	MS-D	MS-D	6	Irr, Sm, Yellow flesh
B0811-13	10,11	DR	SN-N	R	R-MT	MD	MD	6	Irr, yellow flesh
B0852-7	10,11	Pu	S	R-O	MT	MS-S	MS-S	6	Irr, Sk
B0967-11	10,11	Pu	S	O	MT	MS	MS	5	Irr, unscored Scab
B0984-1	10,11	M-DR	S-SN	R-O	MT	MD-D	MD-D	5	Irr, Sk
B1110-11	6,7	Bu	SN	R-O	R-MT	S-MS	MS-MD	5	Irr, Deep stem end
B1145-2	10,11	L-MR	S-RS	R	R	S-MS	S-MS	7	Sm, Light color
B1214-7	6,7	W-Bu	RS-SN	O	MT	S-MS	MS-MD	3	Ugly, L, Pinkeye
B1240-14	6,7	Bu	SN	O-R	MT	S	MD-D	4	Ugly, Irr, Kn,
B1248-5	6,7	Bu-W	SN-RS	R-O	R-MT	S-MS	MS-MD	4	Irr, Sp, Patchy
B1321-21	6,7	Bu-W	SN	R-O	MT	S-MS	MS-MD	4	Irr
B1415-7	6,7	Bu	N	R-O	R-MT	S	MS-MD	5	Irr, Pinkeye
B1425-9	6,7	Bu	SN	R-O	R-MT	S-MS	MS-MD	5	Irr, Patchy
B1429A-3	6,7	Bu	SN	O-R	MT	S-MS	MS	6	Irr, Scurfy
B1478-8	6,7	W	RS	O	MT	S-MS	S-MS	5	Irr, Kn
B1493-3	10,11	MR	RS-SN	R	R-MT	MS-MD	MD	5	Irr, Yellow flesh
NY101	8,9	Bu	N-SN	R-O	R-MT	S	MS	6	Irr, L, Pinkeye, Yell Fl., int. defects
NY103	4,5,8,9	W	RS-S	O-R	MT-SF	S	MS	7-8	some Stem end decay, Pear shape
NY110	2,3,8,9	W	S	O-R	SF	S-MS	MD	6-7	Irr, Sk, Bright
NY112	8,9	Bu	N	O-R	MT	S-MS	MS-MD	5	Irr, Scurfy
NY115	8,9	W-Bu	S	O-R	MT	S	MS	8	Attractive, some Stem end decay
NY118	10,11	L-MR	RS-SN	R-O	SF	S	MS	6	Sk, St, Light color
NY119	8,9	Bu	RS-SN	R-O	SF-MT	S-MS	MS-MD	5	Irr, Patchy, Stem end decay
NY121	8,9	W	RS	R	R	S-MD	MS-MD	5	Irr, Squatty, Sm
NY122	8,9	W	RS	O	MT	S	MS-MD	6	Irr, L, SI Yellow flesh
R6-4	8,9	Bu	SN	O	MT	S-MS	MS-MD	5	Irr, Kn
R17-2	8,9	W	RS	O-R	MT	S	MS	7	SI Irr
R17-7	8,9	Bu	RS-SN	R-O	MT	S-MS	MS-MD	6	Irr, L
R17-11	8,9	W	RS	R-O	MT	S-MS	MS-MD	7	SI Irr, L
R17-19	8,9	W	RS	O-R	SF-MT	S	MS-MD	7	SI Irr
R17-106	8,9	W-Bu	RS-SN	R-O	MT	S-MS	MS-MD	6	SI Irr, St
R41-11	8,9	Bu-W	SN-RS	R-O	R-MT	S	MS-MD	6	SI Irr, L, Pinkeye

COLOR: B=brown, Bu=buff, Pi=pink, Pu-lav=purple-lavender, R=red, T=tan, W=white. Modifiers: L=light, M=medium, D=dark. TEXTURE: N=netted, R=russet, S=smooth. Modifiers: H=heavy, M=moderate, R=Relatively, S=Slightly. SHAPE: L=long, O=oblong, R=round. EYE DEPTH: D=deep, M=moderate, S=shallow. TUBER DEPTH: MT=medium thick, R=round, F=flattened, SF=slightly flattened. COMMENTS: AE = apical eyes, BL = black leg L=prominent lenticels, Ct=Chain Tubers, Irr=irregular, Kn=knobs, Sc=scab, SE = stem end, Sk=skinned, SI=slightly, Sm=small, Sp=sprouts, St=Stolons, SS=Silver scurf, F=flesh, Pi=pink, VD = vascular discoloration Y=Yellow, W=white.

Long Island Table 2. Yield, marketable yield, size distribution, appearance, and specific gravity of early white-skinned clones grown at Riverhead, N.Y.

Clone	Total Yield	Marketable Yield		Size Distribution (%)				Appear- ance ¹	Specific ² Gravity
	(cwt/A)	(cwt/A)	percent of std.	< 2"	2 to 2.5"	2.5 to 3.25"	3.25 to 4"		
Season 118 days									
Superior	498	456	100	8	31	56	5	5	76
Andover (Cornell)	461	437	96	5	27	59	8	7	78
Andover (Maine)	439	422	92	4	27	58	11	7	77
Monona	385	326	71	15	39	44	2	5	67
Reba	507	463	101	9	23	60	8	7	72
AF1470-6	521	470	103	8	16	51	22	7	60
AF1565-12	426	393	86	8	28	58	7	5	64
NY110	465	435	95	6	31	57	6	6	77
Waller-Duncan									
LSD (0.05)	(26)	(28)							(3)

Planted on 4/14/98, rotocut on 8/10/98, harvested on 8/11/98.

¹ -Appearance ratings based on a scale of 1 to 9, 1 = extremely poor, 9 = excellent appearance.

² -1.0 is excluded from specific gravity readings.

Long Island Table 3. Maturity, and external and internal defects of early white-skinned clones grown at Riverhead, N.Y.

Clone	Maturity ¹ on	Tuber Defects (%)					Percentage				
	8/10/98	Sun- Total	Mis- burn	Growth shapen	Cracks	Other ²	Hollow heart	Brown center	Internal Necrosis		
									Sl.	Mod.	Sev.
Season 118 days											
Superior	3	3	1	1	0	1	3	3	5	0	0
Andover (Cornell)	2	1	0	1	0	0	3	10	3	0	0
Andover (Maine)	3	1	1	0	0	0	5	3	0	0	0
Monona	5	4	1	1	0	1	5	0	20	20	20
Reba	4	5	1	1	1	1	8	8	0	8	0
AF1470-6	3	6	2	0	4	1	0	3	13	10	28
AF1565-12	3	2	1	2	0	0	8	0	8	3	0
NY110	5	2	0	2	0	0	18	0	0	0	0

¹ -Vine maturity ratings based on a scale of 1 to 9, 1 = completely dead, 9 = green and vigorous.

² -Other includes defects such as rhizoctonia (Rh), prominent lenticels (L), pink eye (PE), scab (Sc), decay (Dk), stem end decay (SED) and other defects scorable against a U.S. No. 1 grade, primary defects listed in (). Mechanical defects, however, were not scored.

Long Island Table 4. Yield, marketable yield, size distribution, appearance, and specific gravity of main season NE184 white-skinned clones grown at Riverhead, N.Y.

Clone	Total	Marketable Yield		Size Distribution (%)				Appear- ance ¹	Specific ² Gravity
	Yield (cwt/A)	percent of std.	< 2"	2 to 2.5"	2.5 to 3.25"	3.25 to 4"			
Season 138 days									
Katahdin	453	374	100	17	29	44	9	6	75
Allegany	504	427	114	15	15	48	23	6	77
Atlantic	492	419	112	15	26	52	8	6	90
Kennebec	563	341	91	40	22	32	7	3	74
Norwis	448	376	101	13	20	41	23	5	72
Reba	444	384	103	12	22	50	15	7	74
Yukon Gold	381	329	88	14	28	50	9	6	81
AF1437-1	491	429	115	12	28	54	6	5	62
AF1475-20	477	426	114	10	13	58	18	5	74
AF1606-8	414	352	94	15	40	42	4	4	75
AF1615-1	485	408	109	16	39	44	1	7	80
B0564-8	445	376	101	15	32	45	7	5	76
B0766-3	536	489	131	9	20	51	20	5	83
NY103	521	437	117	16	20	51	13	8	72
Waller-Duncan									
LSD (0.05)	(62)	(67)							(4)

Planted on 4/17/98, vine killed on 9/2/98, harvested on 10/6/98.

¹ -See rating system outlined in Table 2.

² -1.0 is excluded from specific gravity readings.

Long Island Table 5. Maturity, and external and internal defects of main season NE 184 white-skinned clones grown at Riverhead, N.Y.

Clone	Maturity ¹					Percentage				
	on 8/28/98	Sun- burn	Mis- shapen	Growth cracks	Other ²	Hollow heart	Brown center	Internal Necrosis		
								Sl.	Mod.	Sev.
Season 138 days										
Katahdin	5	5	2	1	3 (PE)	25	0	10	0	0
Allegany	5	3	3	0	5 (L)	3	3	0	0	0
Atlantic	4	2	3	3	1	20	10	13	20	25
Kennebec	6	11	15	8	3 (PE,L)	10	3	8	0	0
Norwis	3	2	2	2	4 (PE)	18	5	15	8	0
Reba	3	6	2	1	1	33	5	0	0	0
Yukon Gold	2	2	5	0	1	18	5	3	0	0
AF1437-1	4	1	4	3	1	0	3	0	0	0
AF1475-20	4	1	3	2	1	15	5	18	13	10
AF1606-8	2	2	4	1	1	3	3	0	0	0
AF1615-1	4	2	5	1	1	0	3	0	0	0
B0564-8	4	2	1	0	3 (Rh)	0	0	0	3	0
B0766-3	5	1	2	0	2 (PE)	23	0	3	3	0
NY103	4	4	3	1	4 (SED)	13	10	0	3	0

¹ -See rating system outlined in Table 3.

² -See Footnote 2 in Table 3.

Long Island Table 6. Yield, marketable yield, size distribution, appearance and specific gravity of main season USDA white-skinned clones grown at Riverhead, N.Y.

Clone	Total Yield	Marketable Yield		Size Distribution (%)					Appear- ance ¹	Specific ² Gravity
	(cwt/A)	(cwt/A)	percent of std.	< 2"	2 to 2.5"	2.5 to 3.25"	4"	> 4"		
Season 139 days										
Katahdin	580	497	100	14	32	50	4	0	6	73
Carla	413	300	60	28	53	19	0	0	6	72
Norwis	530	478	96	10	18	57	15	0	6	68
B0178-34	525	462	93	12	17	56	15	0	6	89
B0564-8	470	422	85	10	28	55	7	0	6	75
B0564-9	486	429	86	9	16	49	23	3	6	75
B0766-3	497	445	90	10	20	55	14	0	5	84
B1110-11	421	358	72	14	26	51	8	0	5	82
B1214-7	531	387	78	27	12	43	18	0	3	84
B1240-14	534	374	75	30	18	42	10	0	4	82
B1248-5	450	382	77	15	37	45	3	0	4	78
B1321-21	486	399	80	18	22	49	11	0	5	83
B1415-7	534	437	88	16	10	42	30	2	5	79
B1425-9	473	382	77	19	29	48	4	0	5	89
B1429A-3	476	414	83	13	27	56	4	0	6	79
B1478-8	465	382	77	18	26	52	4	0	5	73
Waller-Duncan										
LSD (0.05)	(38)	(47)								(3)

Planted on 4/16/98, vine killed on 9/2/98, harvested on 9/29/98.

¹ -See rating system outlined in Table 2.

² -1.0 is excluded from specific gravity readings.

Long Island Table 7. Maturity, and external and internal defects of main season USDA white-skinned clones grown at Riverhead, N.Y.

Clone	Maturity ¹		Tuber Defects (%)					Percentage			
	on 8/28/98	Total	Sun- burn	Mis- shapen	Growth cracks	Other ²	Hollow heart	Brown center	Internal Necrosis		
									Sl.	Mod.	Sev.
Season 139 days											
Katahdin	4	6	3	1	0	1	0	5	20	8	0
Carla	2	14	2	11	0	1	0	5	10	0	0
Norwis	3	6	1	1	2	2	18	18	18	5	8
B0178-34	3	9	3	3	1	2	0	8	13	10	0
B0564-8	1	4	1	1	0	2	3	3	0	0	0
B0564-9	1	6	4	1	0	1	20	0	0	3	0
B0766-3	3	7	1	5	0	2	13	13	0	0	0
B1110-11	2	8	2	2	0	4 (SED)	18	0	3	3	0
B1214-7	3	24	2	11	0	11 (PE,L)	0	23	0	0	0
B1240-14	5	25	2	13	0	10 (Sc,L)	38	3	35	23	5
B1248-5	2	7	3	3	1	1	3	8	3	3	0
B1321-21	3	11	2	2	3	3 (L)	13	3	0	0	0
B1415-7	5	14	3	3	1	7 (PE,L)	33	3	8	10	0
B1425-9	2	11	2	7	1	1	3	23	0	0	0
B1429A-3	2	7	1	2	0	4 (Sc,PE)	0	0	0	0	0
B1478-8	2	14	2	9	0	1	8	3	0	0	0

¹ -See rating system outlined in Table 3.

² -See Footnote 2 in Table 3.

Long Island Table 8. Yield, marketable yield, size distribution, appearance and specific gravity of main season Cornell University white-skinned clones grown at Riverhead, N.Y.

Clone	Total Yield	Marketable Yield	Size Distribution (%)						Appear- ance ¹	Specific ² Gravity
	(cwt/A)	(cwt/A)	percent of std.	< 2"	2 to 2.5"	2.5 to 3.25 to 3.25"	4"	> 4"		
Season 139 days										
Katahdin	573	498	100	13	34	50	3	0	6	73
NY101	581	476	96	18	18	55	9	0	6	72
NY103	476	423	85	11	30	55	3	0	7	69
NY110	433	397	80	8	25	60	7	0	7	77
NY112	580	526	106	7	17	62	12	2	5	79
NY115	431	379	76	12	30	48	9	0	8	75
NY119	424	379	76	10	28	53	8	0	5	85
NY121	384	322	65	16	52	31	1	0	5	78
NY122	506	430	86	15	43	42	0	0	6	73
R6-4	548	453	91	17	21	60	2	0	5	81
R17-2	427	398	80	7	24	65	5	0	7	69
R17-7	574	498	100	13	34	51	2	0	6	66
R17-11	463	429	86	7	25	59	9	0	7	63
R17-19	505	456	92	9	31	48	11	0	7	68
R17-106	529	446	90	15	28	49	7	1	6	68
R41-11	540	448	90	16	20	46	16	1	6	67
<i>Waller-Duncan</i>										
LSD (0.05)	(43)	(44)								(3)

Planted on 4/16/98, vine killed on 9/2/98, harvested on 9/29/98.

¹ -See rating system outlined in Table 2.

² -1.0 is excluded from specific gravity readings.

Long Island Table 9. Maturity, and external and internal defects of main season Cornell University white-skinned clones grown at Riverhead, N.Y.

Clone	Maturity ¹ on	Tuber Defects (%)					Percentage				
	8/28/98	Sun- Total burn	Mis- shapen	Growth cracks	Other ²		Hollow heart	Brown center	Internal Necrosis		
									S1.	Mod.	Sev.
Season 139 days											
Katahdin	4	6	2	1	0	2	3	8	18	8	0
NY101	3	14	2	1	0	10 (L,PE)	5	8	25	10	3
NY103	2	6	2	1	0	3 (SED)	5	5	5	3	0
NY110	1	4	1	3	0	0	3	0	0	0	0
NY112	2	4	3	0	0	1	3	0	8	0	0
NY115	2	4	1	2	0	2	0	0	10	3	0
NY119	1	4	0	1	0	2	8	5	5	3	0
NY121	1	2	0	1	0	0	0	0	0	0	0
NY122	2	7	1	4	1	1	0	0	0	0	0
R6-4	2	14	2	7	4	1	5	3	5	0	0
R17-2	1	3	2	1	0	0	3	0	3	0	0
R17-7	2	5	1	2	1	2	0	0	0	0	0
R17-11	2	3	1	1	0	2	0	0	8	0	0
R17-19	2	4	1	2	0	1	3	0	3	0	3
R17-106	3	8	3	3	0	2	0	8	3	0	0
R41-11	2	11	3	1	0	7 (L,PE)	3	10	23	8	5

¹ -See rating system outlined in table 3.

² -See Footnote 2 in Table 3.

Long Island Table 10. Yield, marketable yield, size distribution, appearance and specific gravity of red-skinned clones grown at Riverhead, N.Y.

Red skinned clones grown at Ravenhead, N. Y.									
	Total	Marketable Yield		Size Distribution (%)				Appear- ance ¹	Specific ² Gravity
	Yield		percent						
Clone	(cwt/A)	(cwt/A)	of std.	< 2"	2 to 2.5"	2.5 to 3.25"	3.25 to 4"		
Season 140 days									
Chieftain	553	487	100	12	41	46	1	6	64
Dark Red Norland	358	287	59	20	63	17	0	6	59
Redsen	362	303	62	16	55	28	0	8	64
Rideau	412	346	71	16	35	48	1	5	67
B0811-4	223	165	34	26	58	16	0	6	79
B0811-13 (NE)	454	409	84	10	30	55	4	6	65
B0811-13 (USDA)	421	369	76	12	30	49	9	6	66
B0852-7	382	333	68	13	43	42	2	6	73
B0967-11	438	369	76	15	26	50	8	5	77
B0984-1	478	431	88	10	24	56	10	5	77
B1145-2	305	249	51	19	61	20	0	7	62
B1493-3	321	268	55	16	45	38	1	5	69
NY118	515	457	94	11	35	48	6	6	60
Waller-Duncan									
LSD (0.05)	(41)	(46)							(3)

Planted on 4/24/98, rotocut on 9/1/98, harvested on 9/10/98.

¹ -See rating system outlined in Table 2.

² -1.0 is excluded from specific gravity readings.

Long Island Table 11. Maturity, and external and internal defects of red-skinned clones grown at Riverhead, N.Y.

Clone	Maturity ¹		Tuber Defects (%)				Percentage			
	on		Sun-	Mis-	Growth		Hollow	Brown	Internal Necrosis	
	8/28/98	Total	burn	shapen	cracks	Other ²	heart	center	Sl.	Mod. Sev.
Season 140 days										
Chieftain	3	3	1	1	2	0	0	8	18	5 0
Dark Red Norland	2	1	0	0	1	0	0	0	0	0 0
Redsen	1	5	0	1	4	0	0	0	0	0 0
Rideau	2	9	0	5	4	0	3	0	0	0 0
B0811-4	1	2	0	1	1	0	0	0	0	0 0
B0811-13 (NE)	2	2	1	1	0	0	0	13	0	0 0
B0811-13 (USDA)	1	4	1	2	0	0	3	15	3	0 0
B0852-7	1	3	0	1	1	1	5	35	0	0 0
B0967-11	2	11	0	2	1	7 (Sc)	0	3	0	0 0
B0984-1	2	5	0	2	2	1	0	5	0	0 0
B1145-2	1	1	0	0	1	0	0	0	0	0 0
B1493-3	1	4	0	3	1	0	0	0	0	0 0
NY118	4	1	0	1	1	0	0	0	0	0 0

¹ -See rating system outlined in the Table 3.

² -See Footnote 2 in Table 3.

Long Island Table 12. Yield, marketable yield, size distribution, appearance and specific gravity of standard Superior and Naturemark Newleaf Superior 259 grown at Riverhead, N.Y.

Clone	Total	Marketable	Size Distribution (%)				Appear- ¹	Specific ²
	Yield	Yield	2 to	2.5 to	3.25 to	4"	ance	Gravity
	(cwt/A)	(cwt/A)	< 2"	2.5"	3.25"	4"		
Season 127 days								
Superior	451	416	8	27	58	7	6	75
Superior 259	445	396	5	36	52	7	6	73
<i>Waller-Duncan</i>								
LSD (0.05)	NS	NS						NS

Planted on 4/28/98, vine killed on 9/2/98, harvested on 10/6/98.

¹ -See rating system outlined in Table 2.

² -1.0 is excluded from specific gravity readings.

Long Island Table 13. Maturity, and external and internal defects of standard Superior and Naturemark Newleaf Superior 259 grown at Riverhead, N.Y.

Clone	Maturity ¹	Tuber Defects (%)			Percentage				
	on	Mis-	Other ²		Hollow heart	Brown center	Internal Necrosis		
		Total	shapen				Sl.	Mod.	Sev.
Season 127 days									
Superior	1	3	2	1	0	0	5	0	0
Superior 259	2	4	2	1	0	0	0	0	0

¹ -See rating system outlined in the text.

² -See footnote 2 in Table 3.

Long Island Table 14. Yield, marketable yield, size distribution, and maturity of white-skinned diploid potato clones grown at Riverhead, N.Y.

Clone	Total	Marketable	Size Distribution (%)				Size Distribution		Maturity ¹
	Yield	Yield	2 to	2.5 to	3.25 to	4"	2 to	2.5 to	on
	(cwt/A)	(cwt/A)	< 2"	2.5"	3.25"	4"	4 in.	4 in.	8/28/98
Season 138 days									
BD113-3	47	16	66	34	0	0	34	0	1
BD132-2	74	56	24	62	14	0	76	14	1
BD146-2	50	13	74	26	0	0	26	0	1
BD146-4	62	24	62	37	2	0	38	2	1
BD173-1	131	88	33	56	10	0	67	10	1
<i>Waller-Duncan</i>									
LSD (0.05)	(12)	(12)							

Planted on 4/17/98, vine killed on 9/2/98, harvested on 10/6/98.

¹ -See rating system outlined in Table 3.

Long Island Table 15. Yield and quality of early selection lines and recently named varieties in a non-replicated observation trial grown at Riverhead, N.Y.

Clone	% of				% Internal Defects				Internal Necrosis				Eye Depth				Comments
	Yield (cwt/A)		% standard	Spec.	HH	BC	Sl.	M	S	Color	Texture	Shape	Depth	Apical			
	Total	2-4												Lateral	ance		
Season-146 days																	
White-skinned lines																	
Katabdin	506	312	100	27	70	0	0	0	0	0	W	RS	O-R	SF	S	MD	7 St, sl irr
Katabdin	599	514	165	7	74	0	0	0	0	0	W	RS	R-O	MT	S	MD	7 St
Katabdin	570	463	149	13	71	20	0	0	0	0	W	RS	O-R	SF	S	MD	7 okay
Allegany	653	609	195	3	78	0	0	0	0	0	Bu	SN	R	MT	S	D	6 irr
Norwis	534	418	134	17	67	30	20	10	0	0	W	S	O	SF	MD	MD	6
Norwis	514	465	149	7	67	30	0	20	10	0	W	S	O	SF	MD	D	5 irr
Reba	558	507	163	3	65	10	0	0	0	0	W	RS	O	MT	MS	MD	7 irr
Superior	479	398	128	9	68	0	0	10	0	0	Bu	SN	O-R	SF	MD	MD	5 irr, Sp
Superior	535	427	137	14	71	0	0	0	0	0	Bu	SN	O-R	MT	MD	D	4 irr, some Sp
Superior	430	320	103	18	74	10	0	0	0	0	Bu	SN	O-R	SF	D	D	4 irr, L, Sp
NY122	538	437	140	9	71	10	0	0	0	0	W	RS	O	SF	S	MS	6 sl irr
R6-4	625	460	148	24	81	10	0	0	0	0	Bu	SN	O	MT	MS	D	4 irr, Kn
S106-17	485	424	136	3	75	0	0	0	0	0	Bu	RS	O	MT	S	MS	7 patchy
S26-2	599	408	131	25	73	10	20	40	10	0	Bu	SN	O	SF	S	MD	4 L, irr
S27-2	515	411	132	16	68	20	0	10	0	0	W	SN	O	MT	S	MD	5 L, PE, sl Y Fl
S27-2	604	454	146	20	72	0	0	0	0	0	Bu	MN	O-R	SF	S	MS	6 Y Fl, PE, L, patchy
S3-1	457	379	122	14	65	0	0	0	0	0	Bu	SN	R	R	S	MD	7
S300-13	548	486	156	4	73	0	0	0	0	0	W	RS	O-R	F	S	MD	5 irr
S31-1	773	666	214	11	61	0	0	0	0	0	W	RS	O	MT	S	VD	0 PE, Sl Y
S32-2	501	428	137	10	83	0	0	0	0	0	Bu	RS	O-R	MT	S	MD	6 irr
S32-2	529	479	154	4	84	10	0	10	0	0	W	SN	O-R	MT	MD	VD	6 PE, irr
S32-3	521	437	140	8	76	0	0	0	0	0	W	RS	O	R	S	MS	7 sl irr, L
S32-3	551	500	160	3	72	20	0	10	10	0	Bu	RS	O-R	MT	MS	MD	7 sl irr but ok
S33-5	514	494	159	2	73	0	0	0	0	0	Bu	SN	R-O	R	MS	MS	7 ok
S34-3	531	440	141	13	78	20	0	0	0	0	Bu	SN	O-R	MT	MS	MD	6 PE, sl irr
S4-2	612	550	177	3	68	0	0	0	0	0	Bu	SN	O	MT	S	MS	7 ok, 7+

Long Island Table 15 continued. Yield and quality of early selection lines and recently named varieties in a non-replicated observation trial grown at Riverhead, N.Y.

Clone	Yield (cwt/A)		% standard 2 to 4"	% Def.	Spec. Grav.	% Internal Defects								Color	Texture	Shape	Eye Depth			Appearance	Comments
	Total	2-4"				HH	BC	Internal Necrosis				Depth	Lateral				Apical				
								SI	M	S	S										
Season - 146 days																					
Red/purple cont.																					
Dark Red Norland	401	358	100	1	63	0	0	0	0	0	MR	S	O	MT	MS	MS	7				
Dark Red Norland	376	300	84	4	59	0	0	0	0	0	Pi	RS	R-O	MT	MS	MS	5	Sp, poor color, irr			
B1521-2	516	450	126	3	69	0	0	0	0	0	LR	SN	R	R	MS-D	MD	0	irr			
B1523-4	557	484	135	2	66	0	0	0	0	0	MR	SN	R	SF	MS	MD	4	some sp, irr			
B1763-4	428	362	101	6	67	0	0	0	0	0	Pu	SN	O-R	MT	MD	MD	6	wh Fl, Sk			
NY118	513	423	118	2	60	0	0	0	0	0	Pi	SN	R	R	S	MS	6	too light, Sk			
S45-7	481	379	106	1	68	0	0	0	0	0	Pu	RS	O	MT	MS	MS	6	sl irr, w cortex, mottled p			
S45-7	396	325	91	0	65	0	0	0	0	0	Pu	S	O	MT	MD	MS	6	sl irr, w cortex and core,			
S48-6	494	376	105	18	60	0	0	0	0	0	MR	S	O	R	S	S	7	sl kidney, rot, pi fl, w co			
S48-6	421	342	96	8	57	0	10	0	0	0	M-DR	S	O	R	MS	MS	6	some kidney, rot, faint pi			
S49-3	499	374	105	13	64	0	0	0	0	0	Pu	S	O	MT	S	S	6	Pu, w cortex and water			
S49-3	431	263	73	16	60	0	0	0	0	0	Pu-la	S	O	R	S	MS	6	kidney, sk pu-lav, mot p			
T17-5	612	572	160	2	71	10	0	0	0	0	LR	S	O	MT	MS	MS	6	sl irr, pi fl			
T17-5	551	486	136	3	70	0	0	0	0	0	LR	RS	O-R	SF	MS	MS	5	irr, mottle pi Fl			
T18-5	634	546	153	2	60	0	0	0	0	0	DR	RS	O-R	MT	MS	MS	6	faint pink flesh			
Russet skinned																					
Century Russet	554	311	100	11	78	0	0	0	0	0	T	LR	L	MT	S	S	7	irr, Sc			
Century Russet	825	633	203	6	76	0	0	0	0	0	T	LR	L	SF	S	S	6	sl irr, PE			
Legend	327	219	70	5	69	0	0	0	0	0	Br	MR	L-O	SF	S	S	7				
Legend	298	223	72	3	67	10	10	0	0	0	Br	MR	L-O	MT	S	S	6	irr			
Russet Norkotah	530	309	99	13	73	0	0	0	0	0	Br	MR	L	MT	S	S	6	irr			
Russet Norkotah	534	391	125	11	69	0	0	0	0	0	0	0	0	0	0	0	0				
Russet Norkotah	559	377	121	11	72	0	0	0	0	0	Br	M-HR	L	MT	S	S	6	PE, irr			
Russet Norkotah	596	392	126	15	75	0	0	0	0	0	Br	MR	L	MT	MS	MS	6	irr			
A082611-7	488	369	118	2	78	0	0	0	0	0	T	MR	L	MT	S	S	8	ok			
A84118-3	511	365	117	16	75	0	0	0	0	0	T	MR	L	MT-R	S	S	5	irr, sl kidney, Sc			
A84180-8	463	325	104	10	75	10	0	0	0	0	Br	MR	L	R	S	S	7	RB like, cyl, Sc			
B1004-8	472	273	88	7	78	0	0	10	10	0	Br	HR	O-L	MT	S	S	6				
B1004-8	561	381	122	6	78	10	0	0	0	0	Br	HR	O	R	S	S	7				
B9922-11	504	303	97	19	84	10	0	0	0	0	Bu	HN	O-L	MT	S	S	7	ok			
B9922-11	503	384	123	9	80	0	0	0	10	0	Bu	HN	O-L	MT	S	S	6				
B9922-11	586	417	134	14	80	0	0	10	0	0	Br	HR	O-L	SF	S	S	6	irr			
B9922-11	517	345	111	11	84	30	0	0	0	0	Br	HR	O-L	SF	S	S	6				
White-skinned lines with poor yield and/or appearance.																					
AF1845-6	S14-2	S300-7	S31-7		B1493-3	B1524-2	B1524-2	B1524-2	B1524-2	B1524-2	B1761-2	B1761-2	B1763-5	T17-2	T18-3			Russet-skinned			
R17-2	S28-2	S300-9	S4-3		B1522-1	B1526-1	B1526-1	B1526-1	B1526-1	B1526-1	B1761-8	B1761-8	S45-5		T18-1			A86102-6			
																		B1070-88			

Long Island Table 16. The effect of N rate on yield, marketable yield, size distribution, appearance and specific gravity of NY103 grown at Riverhead, N.Y.

Total N Rate/A	Total Yield (cwt/A)	Marketable Yield (cwt/A)	percent of std.	Size Distribution (%)				Appear- ¹ ance	Specific ² Gravity
				< 2"	2 to 2.5"	2.5 to 3.25"	3.25 to 4"		
Season 142 days									
100	470	422	100	10	37	49	3	7	70
150	484	413	98	15	34	47	4	7	71
200	490	417	99	15	31	49	6	7	72
250	474	411	97	13	35	46	6	7	72
<i>Waller-Duncan</i>									
<i>LSD (0.05)</i>	<i>NS</i>	<i>NS</i>							<i>NS</i>

Planted on 4/13/98, fertilizer rate was N rate listed-200-200/A, vine killed on 9/2/98, harvested 9/23/98.

¹ -See rating system outlined in Table 2.

² -1.0 is excluded from specific gravity readings.

Long Island Table 17. The effect of N rate on maturity, external and internal defects of NY103 grown at Riverhead, N.Y.

Total N Rate/A	Maturity ¹ on 8/28/98	Tuber Defects (%)					Percentage				
		Sun- Total	Mis- burn	Growth shapen	cracks	Other ²	Hollow heart	Brown center	Internal Necrosis		
									Sl.	Mod.	Sev.
Season 142 days											
100	2	3	2	1	0	1	5	0	3	0	0
150	2	8	2	1	1	3	5	3	5	0	0
200	3	8	3	2	1	3	5	3	8	3	0
250	3	6	2	2	1	1	0	5	5	3	3

¹ -See rating system outlined in Table 3.

² -See Footnote 2 in Table 3.

Long Island Table 18. The effect of N rate on yield, marketable yield, size distribution, appearance and specific gravity of NY110 grown at Riverhead, N.Y.

Total N Rate/A	Total Yield	Marketable Yield	Size Distribution (%)				Appear- ¹	Specific ²
	(cwt/A)	(cwt/A)	percent of std.	< 2"	2 to 2.5"	2.5 to 3.25"	3.25 to 4"	ance Gravity
Season 141 days								
100	352	316	100	10	40	44	5	80
150	387	341	108	11	39	45	4	81
200	390	348	110	11	39	44	6	81
250	384	343	109	11	33	50	6	82
<i>Waller-Duncan</i>								
<i>LSD (0.05)</i>	<i>NS</i>	<i>NS</i>						<i>NS</i>

Planted on 4/14/98, fertilizer rate was N rate listed-200-200/A, vine killed on 9/2/98, harvested 9/23/98.

¹ -See rating system outlined in Table 2.

² -1.0 is excluded from specific gravity readings.

Long Island Table 19. The effect of N rate on maturity, external and internal defects of NY110 grown at Riverhead, N.Y.

Maturity ¹		Tuber Defects (%)					Percentage				
Total N	on	Sun-	Mis-	Growth			Hollow	Brown	Internal Necrosis		
Rate/A	8/28/98	Total	burn	shapen	cracks	Other ²	heart	center	Sl.	Mod.	Sev.
Season 141 days											
100	2	3	1	2	0	0	13	0	0	0	0
150	1	4	1	3	0	0	3	0	0	0	0
200	2	4	2	2	0	0	0	0	0	0	0
250	2	4	2	2	0	0	8	0	0	0	0

¹ -See rating system outlined in Table 3.

² -See Footnote 2 in Table 3.

Long Island Table 20. The effect of N rate on yield, marketable yield, size distribution, appearance and specific gravity of NY115 grown at Riverhead, N.Y.

	Total	Marketable Yield	Size Distribution (%)				Appear- ¹	Specific ²	
Total N	Yield	percent	2 to	2.5 to	3.25 to				
Rate/A	(cwt/A)	(cwt/A)	of std.	< 2"	2.5"	3.25"	4"	ance	Gravity
Season 141 days									
100	361	322	100	11	34	48	8	7	78
150	406	362	113	11	35	44	10	7	76
200	435	388	121	11	32	46	11	7	78
250	422	371	115	12	33	46	9	7	79
Waller-Duncan									
LSD (0.05)	(46)	(46)							NS

Planted on 4/14/98, fertilizer rate was N rate listed-200-200/A, vine killed on 9/2/98, harvested 9/23/98.

¹ -See rating system outlined in Table 2.

² -1.0 is excluded from specific gravity readings.

Long Island Table 21. The effect of N rate on maturity, external and internal defects of NY115 grown at Riverhead, N.Y.

grown at Riverhead, N.Y.											
Maturity ¹		Tuber Defects (%)					Percentage				
Total N	on	Sun-	Mis-	Growth			Hollow	Brown	Internal Necrosis		
Rate/A	8/28/98	Total	burn	shapen	cracks	Other ²	heart	center	Sl.	Mod.	Sev.
Season	141 days										
100	2	4	2	1	0	1	5	0	0	0	0
150	1	4	2	1	0	1	3	0	0	0	0
200	1	4	2	1	0	0	0	0	3	0	0
250	1	5	3	2	0	0	3	0	0	0	0

¹ -See rating system outlined in Table 3.

² -See Footnote 2 in Table 3.

Long Island Table 22. After-cooking darkening and blackspot ratings of clones grown in 1997.

Clone	White 2			White 3			Red			Russet		
	1997 Tables 4-5			1997 Tables 6-7			1997 Tables 8-9			1997 Tables 10-11		
	ACD	BS	Clone	ACD	BS	Clone	ACD	BS	Clone	ACD	BS	Clone
Katahdin	4.9	6.0	Katahdin	5.0	6.0	Katahdin	5.0	5.9	Chieftain	5.0	5.9	Century Rus
Atlantic	4.9	6.0	AF1606-8	3.5	5.9	Allegany	5.0	5.8	Nordonna	5.0	6.0	Rus Norkotah
Itasca	5.0	6.0	AF1714-2	5.0	5.9	Caesar	5.0	6.0	Dark Red Norland	4.7	6.0	B0915-3
Kennebec	5.0	6.0	AF1764-9	4.8	6.0	Norwis	5.0	6.0	Redsen	4.7	6.0	B1004-8 (USDA)
Reba (NY87)	5.0	6.0	AF1773-1	4.7	5.9	NY103	4.3	5.9	Red Ruby	5.0	6.0	B1004-8 (NE184)
Yukon Gold	5.0	6.0	B0564-8	4.9	5.8	NY109	4.6	5.9	Rideau	5.0	6.0	B9922-11 (USDA)
AF1480-5	5.0	5.9	B0564-9	5.0	5.9	NY110	4.8	6.0	B0811-4	5.0	5.6	B9922-11 (NE184)
AF1615-12	4.9	6.0	B0766-3	4.8	5.2	NY115	5.0	6.0	B0811-13 (NE184)	5.0	5.9	W1099Rus
B0766-3	5.0	5.6	B1214-7	5.0	5.8	P21-2	4.9	6.0	B0811-13 (USDA)	5.0	5.9	
NY102	4.9	5.1	B1240-12	5.0	5.9	P32-3	4.8	5.6	B0967-11	5.0	5.9	
NY103	4.5	6.0	B1240-14	5.0	5.4	P63-1	4.9	6.0	R174-1	5.0	6.0	
			B1429A-6	5.0	5.8	P73-2	5.0	5.7	R174-2	5.0	5.9	
						Q3-12	5.0	5.3				
						Q8-2	4.6	5.8				

Fisher's Protected

LSD (0.05) (0.2) (0.2) (0.4) (0.3) (0.2) (0.2) (0.1) (0.1) (0.1) (0.2)

After-cooking darkening (ACD) rating based on a scale of 1 to 5; 1 = severe darkening, 5 = no after-cooking darkening. Five tubers rated per replication, four replications in each experiment. Tubers were peeled and dipped in a 0.5% solution of sodium bisulfite and cooked in an autoclave for 7 minutes and rated after 20 minutes. Blackspot (BS) determinations are based on approximately ten tubers per replication. Tubers were stored at 40° F and bruised between 2/9/98 and 2/23/98 and then stored at 55° F. Bruised areas were peeled and evaluated two days after impact. Each tuber received a blow in each of two locations about 1 to 2 cm from the stem end. The bruising was done by dropping a 300 gram weight a distance of 30 cm. The point of impact was marked by inking the base of the weight. Ratings are based on a scale of 1 to 6 with 1 = severe discoloration and 6 = no discoloration.

New York - Upstate

D.E. Halseth, W.L. Hymes and R.L. MacLaury

Program Scope:

Potato variety yield trials were conducted in three counties in upstate New York in 1998 in which a total of 31 named and 164 numbered clones were evaluated. Eight replicated yield trials were conducted at the Thompson Vegetable Research Farm at Freeville, in Tompkins County, on a Howard gravelly loam soil. Grower trials were conducted on mineral soils near Arkport (Steuben County) and Gainesville (Wyoming County). Trials at the Freeville research farm were irrigated, and all trials were grown using standard commercial cultural practices. As evaluation of potato lines with golden nematode (GN) resistance is of high priority, 8 named and 39 numbered entries in these trials have GN resistance. Marketable yield, tuber quality and appearance, maturity, storage life and chip processing potential are among the important characteristics which are evaluated.

Research Farm Results:

In the early maturity trial four breeding lines out-yielded Superior. AF1470-6, as it did last year, had high yield and the lowest specific gravity. AF1424-7 had the highest marketable yield and the lowest percentage of external and internal defects. R41-11 had the highest tuber set and lowest average tuber weight.

The medium maturity yield trial with 15 entries had 9 GN resistant clones and varieties with total yield above 300 cwt. per acre. B0564-9, NY119 and Yukon Gold had high percentages of hollow heart. Clone R17-7 had the most attractive tuber appearance and the lowest specific gravity. As they did last year, Itasca had the highest total yield while MaineChip had the highest specific gravity.

Of the 15 entries in the medium-late trial, 11 had GN resistance and 4 of these GN lines had marketable yield above 300 cwt. per acre. NY101 was again the highest yielder, with marketable yield at 445 cwt. per acre. Atlantic had the highest specific gravity while NY101 had the highest tuber set and percentage of internal necrosis. NY103 had the best tuber appearance but also higher than average greening of tubers. Kennebec had the highest total percentage of

external defects.

The late maturity trial had 5 GN lines with marketable yield above 300 cwt. per acre. Atlantic had both the highest marketable yield and percentage of hollow heart. B0178-34 had the highest specific gravity while Genesee was the lowest in gravity but best in tuber appearance. Pike had the highest tuber set and lowest average tuber weight.

There are few GN resistant red-skinned clones currently available for testing. Chieftain (GN susceptible), frequently the highest yielding red in the NYS potato industry, again had the highest marketable yield in the red trial. B0967-11 and Red LaSoda had yields similar to Chieftain. NY118 from the Cornell breeding program was the only GN resistant red-skinned line tested at Freeville in 1998. NY118 was rated as the most attractive, with a low percentage of defects, and a medium-red skin color similar to Chieftain. NorDonna had a dark red skin color similar to Redsen, but its marketable yield was 69 cwt. per acre higher. (Note: the red trial consisted of 2 replications.)

B9922-11 (Amey) was the only GN resistant russet-skinned clone available for our russet yield trial. This variety in the past has frequently out-yielded the russet industry standard Russet Burbank in marketable yield, and it did so again this season. Russet Bake-King had the highest marketable yield and specific gravity while AF1875-12 had extremely low yield. A81386-1 and Russet Norkotah-8 were ranked as best in tuber appearance for the russets. A86102-6, Amey, Russet Norkotah and Russet Norkotah-3 had severe hollow heart while Russet Burbank and Russet Norkotah-8 had misshapen tubers.

The USDA advanced observational trial (with 2 replications) evaluated 25 breeding clones. Reported here are the four clones that passed regional trial selection in 1998, none of which had yield above Atlantic or Snowden in our trials. B1425-9 had higher specific gravity than Atlantic or Snowden. B1415-7 and B1425-9 had significant hollow heart problems. B1248-5 and B1429A-3 had the best tuber appearance ratings. B1425-9 had a high tuber set while B1415-7 had the heaviest average tuber weight.

In the Cornell advanced observational trial (with 2 replications) there were 28 new entries with

marketable yield ranging from 235 to 418 cwt. per acre. Eleven of the most promising clones are reported here, with S28-2, S32-2, T2-2 and T3-9 yielding better than Atlantic. Only S111-28 had specific gravity equal to Atlantic and Snowden. S300-7 had the best tuber appearance, while T4-2 had significant hollow heart.

Grower County Trial Results:

The Steuben and Wyoming County chip processing trials had 12 GN clones and one susceptible variety (Snowden) grown in mineral soils. NY103, NY110, NY112, NY120 and Snowden had marketable yields above Atlantic at both locations. NY112 had the highest total and marketable yields at both trial sites. Atlantic had the highest and R17-11 the lowest specific gravity at both locations. NY112, Pike and Snowden had the highest average tuber set and the latter two also had the lowest average tuber weight. There were few external or internal defects at either location.

Table Heading Explanations:

Marketable yield in cwt/a was calculated from total yield less: external defects; undersize tubers (smaller than 1 7/8"); and oversize tubers (over 4" diameter).

Percent marketable yield represents the percentage that each entry's marketable yield is of that of a specified standard variety in that trial.

Size distribution percentage is the weight of a specific size category divided by total yield (including defects).

Specific gravity was taken by potato hydrometer.

Vine maturity ratings were on a nine point scale:

- 1 = all plants completely dead
(very early maturity)
- 9 = all plants full green
(very late maturity)

Tuber shape was classified using the code:

- 1 = round
- 2 = mostly round
- 3 = round to oblong
- 4 = mostly oblong
- 5 = oblong
- 6 = oblong to long
- 7 = mostly long

- 8 = long
- 9 = cylindrical

Tuber appearance was subjectively evaluated using the nine point scale:

- 1 = extremely rough or otherwise unattractive
- 9 = very uniform and attractive

External defects were rated on all material graded.

Internal defects were made on a subset of tubers, usually 10 per replication, taken from size categories 3 and 4.

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Special thanks is given to grower-cooperators: Murray Mahany and family and Jim McCormick of McCormick Farms.

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The Freeville crew is acknowledged for their excellent cooperation in maintaining the research farm plots.

Upstate New York Table 1. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the early maturity trial grown at Freeville, New York - 1998.

Variety/Clone	Total Mkt. Yield		Size Distrib. by Class ¹					Size Distrib. (%)			Mean Tuber #/ft	wt(oz)	Spec. Grav.	
	Yield cwt/A	std	% of	Size Distrib. by Class ¹					1 7/8 to 4 in.	2 1/2 to 4 in.				2 1/2 to 4 in.
				1	2	3	4	5						
AF1424-7	363	333	106	4	38	55	3	1	96	58	7.1	5.3	84	
AF1470-6	438	331	105	4	30	49	14	3	94	63	7.7	5.9	60	
AF1475-20	410	331	105	4	33	45	16	2	94	61	7.4	5.8	76	
AF1565-12	414	311	99	6	38	45	8	3	91	53	8.5	5.0	71	
R41-11	398	331	105	5	44	45	4	2	93	49	8.8	4.7	69	
Superior (std)	372	315	100	3	41	46	8	2	95	54	7.1	5.4	76	
Waller-Duncan														
LSD (k=100)	N.S.	N.S.									0.7	0.5	3	
C.V. (%)	(8)	(11)									(6)	(5)	(2)	

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

Plant Date: Apr 29 Maturity Ratings: Aug 24 Mow Vine Date: Aug 24 Harvest Date: Aug 25

Upstate New York Table 2. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the early maturity trial grown at Freeville, New York - 1998.

Variety/Clone	Plant ¹ Mat. At Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²		
		Shape	Appear.	Total	Sun- Green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
AF1424-7	3.4	3.0	7.4	4.1	2.3	1.5	0.2	0.0	2.5	2.5	0.0
AF1470-6	2.4	3.0	7.0	18.4	6.6	1.3	9.3	1.2	0.0	0.0	2.5
AF1475-20	4.7	2.0	7.5	13.0	6.3	1.9	4.6	0.1	3.3	0.0	0.0
AF1565-12	4.8	5.0	5.0	16.0	10.2	2.4	3.4	0.0	3.3	0.0	0.0
R41-11	2.9	2.0	7.4	10.1	7.1	1.3	1.7	0.0	2.5	0.0	0.0
Superior (std)	2.3	4.0	5.0	10.4	4.8	4.9	0.7	0.0	5.0	5.0	0.0

¹See the standard NE184 rating system for a key to these ratings.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 3. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the medium maturity trial grown at Freeville, New York - 1998.

Variety/Clone	Total Yield cwt/A	Mkt. Yield cwt/A	Yield % of std	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)				Mean Tuber		Spec. Grav.
				1	2	3	4	5	1 7/8 to 4 in.	2 1/2 to 4 in.	#/ft	wt(oz)			
Atlantic (std)	362	295	100	9	52	33	6	1	91	39	8.0	4.7	93		
AF1437-1	328	253	86	10	51	37	2	0	90	39	7.5	4.6	73		
B0564-9	325	278	94	6	45	39	8	1	93	48	6.5	5.2	82		
B0766-3	412	332	112	5	32	44	14	5	90	58	7.0	6.2	83		
Itasca	433	356	121	5	45	41	9	0	95	49	8.6	5.2	78		
MaineChip	227	154	52	28	66	5	0	0	72	5	8.1	2.9	95		
Monona	301	240	81	9	45	38	3	4	87	42	6.2	5.0	75		
NY115	324	284	96	7	45	40	8	1	93	48	6.6	5.1	76		
NY119	341	298	101	8	53	36	3	0	92	39	8.0	4.4	89		
NY122	326	267	90	7	50	39	4	1	93	43	7.0	4.8	81		
Reba	342	291	99	6	38	45	10	1	93	55	6.8	5.2	76		
R17-7	419	370	125	6	57	34	3	0	94	37	9.5	4.6	70		
R17-11	304	255	87	4	27	51	16	3	93	66	4.8	6.7	66		
R17-19	321	266	90	7	36	51	5	2	92	56	6.3	5.3	69		
Yukon Gold	337	306	104	3	38	47	10	2	95	57	5.9	6.0	84		
Waller-Duncan															
LSD (k=100)	33	41									0.9	0.4	3		
C.V. (%)	(7)	(11)									(9)	(7)	(3)		

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

Plant Date: Apr 30 Maturity Ratings: Aug 25 Vine-Kill Date: Aug 26 Harvest Date: Sep 3

Upstate New York Table 4. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the medium maturity trial grown at Freeville, New York - 1998.

Variety/Clone	Plant ¹ Mat. At Vinekill	Tuber Data ¹ Shape	External Tuber Defects (%)					Int. Tuber Defects (%) ²			
			Total	Sun- Green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.	
Atlantic (std)	2.4	2.0	6.0	9.5	4.9	1.7	2.0	1.0	7.5	2.5	0.0
AF1437-1	1.1	3.0	4.9	13.6	3.0	2.0	6.7	1.9	0.0	0.0	2.5
B0564-9	1.2	2.0	7.2	7.4	5.4	1.1	0.4	0.4	40.0	0.0	3.3
B0766-3	4.9	3.0	7.3	9.4	6.7	2.2	0.5	0.0	5.0	0.0	0.0
Itasca	2.4	6.0	5.6	13.0	4.3	1.6	3.0	4.2	0.0	2.5	5.0
MaineChip	2.4	1.0	4.1	4.1	1.5	1.5	0.5	0.6	12.5	0.0	0.0
Monona	1.0	3.0	4.1	7.0	4.2	2.2	0.2	0.3	0.0	0.0	0.0
NY115	1.8	3.0	7.5	5.1	4.2	0.4	0.3	0.2	0.0	0.0	2.5
NY119	2.0	2.0	5.3	4.3	1.9	0.4	0.3	1.7	30.0	2.5	2.5
NY122	1.5	4.0	4.5	10.9	1.8	3.7	1.9	3.4	0.0	7.5	5.0
Reba	1.1	3.0	5.4	7.7	4.7	1.6	0.9	0.6	15.0	0.0	0.0
R17-7	2.0	3.0	7.4	6.0	3.1	0.6	0.6	1.7	0.0	0.0	0.0
R17-11	3.5	1.0	7.8	9.5	2.5	3.6	2.0	1.4	5.0	0.0	2.5
R17-19	1.9	6.0	5.0	8.1	4.5	2.1	1.4	0.1	2.5	0.0	2.5
Yukon Gold	1.1	3.0	6.9	3.8	2.4	0.0	0.8	0.6	22.5	0.0	7.5

¹See the standard NE184 rating system for a key to these ratings.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 5. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the medium-late maturity trial grown at Freeville, New York - 1998.

Variety/Clone	Total		Mkt. Yield cwt/A	% of std	Size Distrib. by Class ¹ (% of total yield)					Size Distrib.(%)			Mean Tuber		Spec. Grav.
	Yield cwt/A	1			2	3	4	5	1 7/8 to 4 in.	2 1/2 to 4 in.	#/ft	wt(oz)			
AF1606-8	272	211	69	15	67	18	0	0	85	19	7.8	3.6	78		
AF1615-1	336	269	88	8	61	28	3	0	92	31	7.9	4.4	81		
AF1773-1	416	310	102	3	28	39	22	8	89	61	6.6	6.6	74		
Atlantic (std)	373	305	100	4	50	37	5	3	93	42	7.6	5.1	94		
Kanona	316	253	83	2	32	44	13	8	89	57	5.5	6.0	81		
Katahdin	382	321	105	5	48	40	5	1	94	45	7.9	5.1	76		
Kennebec	357	267	88	6	46	41	6	1	93	47	7.2	5.2	81		
Norwis	371	326	107	4	36	51	6	2	94	58	6.7	5.8	73		
NY101	493	445	146	5	55	38	2	0	94	40	10.5	4.9	80		
NY103	356	292	96	2	33	51	13	1	96	64	5.9	6.3	77		
NY120	334	298	98	3	38	49	9	1	96	58	5.8	6.0	90		
R6-4	331	286	94	4	49	43	4	0	96	47	6.6	5.2	81		
R17-2	296	277	91	3	54	37	4	1	96	42	6.0	5.1	72		
R17-106	385	335	110	7	62	30	2	0	93	31	9.2	4.3	70		
Snowden	340	299	98	7	73	20	1	0	93	21	8.5	4.2	92		
Waller-Duncan															
LSD (k=100)	44	38									0.7	0.6	5		
C.V. (%)	(9)	(10)									(8)	(9)	(4)		

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

Plant Date: May 1 Maturity Ratings: Aug 25 Vine-Kill Date: Aug 26 Harvest Date: Sept 4

Upstate New York Table 6. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the medium-late maturity trial grown at Freeville, New York - 1998.

Variety/Clone	Plant ¹ Mat. At Vinekill	External Tuber Defects (%)				Int. Tuber Defects (%) ²					
		Tuber Data ¹		Sun- Green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.	
		Shape	Appear.								Total
AF1606-8	1.0	2.0	5.1	7.5	3.7	3.1	0.5	0.1	0.0	2.5	5.0
AF1615-1	3.0	3.0	7.0	11.3	6.7	2.1	1.7	0.8	0.0	0.0	2.5
AF1773-1	5.6	5.0	4.4	13.7	4.6	6.1	2.3	0.8	0.0	2.5	0.0
Atlantic (std)	2.1	2.0	6.5	10.5	3.7	2.8	3.6	0.4	10.0	0.0	0.0
Kanona	2.5	1.0	5.0	9.1	3.7	0.8	3.2	1.4	12.5	0.0	0.0
Katahdin	3.0	3.0	4.5	9.4	5.3	3.5	0.2	0.4	12.5	0.0	0.0
Kennebec	1.0	6.0	4.1	17.8	8.7	4.7	4.4	0.0	0.0	0.0	0.0
Norwis	1.9	3.0	4.6	5.6	1.4	2.0	2.1	0.0	0.0	0.0	2.5
NY101	2.9	3.0	7.0	4.2	2.9	1.4	0.0	0.0	0.0	0.0	10.0
NY103	1.4	3.0	8.0	14.5	10.4	3.8	0.1	0.2	0.0	0.0	0.0
NY120	2.6	3.0	5.0	6.8	1.4	4.0	1.3	0.0	0.0	7.5	2.5
R6-4	1.3	2.0	5.6	8.5	3.1	4.5	0.8	0.0	0.0	2.5	0.0
R17-2	2.3	2.0	7.5	2.0	1.3	0.7	0.0	0.0	2.5	0.0	0.0
R17-106	2.1	1.0	7.5	6.2	4.2	0.8	0.9	0.3	0.0	0.0	0.0
Snowden	1.6	2.0	4.4	5.1	2.7	1.6	0.7	0.0	7.5	0.0	0.0

¹See the standard NE184 rating system for a key to these ratings.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 7. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the late maturity trial grown at Freeville, New York - 1998.

Variety/Clone	Total Yield cwt/A	Mkt. Yield cwt/A	Yield std	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)		Mean Tuber		Spec. Grav.
				1	2	3	4	5	1 7/8 to 4 in.	2 1/2 to 4 in.	#/ft	wt(oz)	
Allegany	363	296	83	4	41	40	12	4	93	52	6.9	5.5	78
Atlantic (std)	414	357	100	4	47	43	4	1	94	47	8.3	5.2	90
B0178-34	359	306	86	8	61	29	2	0	92	31	8.3	4.5	93
B0564-8	319	269	75	13	71	13	2	0	87	16	9.0	3.7	78
Elba	404	334	93	3	33	46	12	5	92	58	7.1	5.9	78
Genesee	317	276	77	7	55	36	3	0	93	38	7.2	4.6	68
Katahdin	401	332	93	4	44	44	7	1	95	51	7.9	5.3	71
NY110	321	263	74	3	41	51	4	1	96	55	6.0	5.5	74
NY112	382	344	96	5	48	41	5	1	95	47	7.5	5.3	80
NYL235-4	430	327	92	6	52	35	6	2	93	41	9.1	4.9	81
Pike	341	287	80	12	72	15	1	0	88	16	9.5	3.7	85
Snowden	393	353	99	7	66	28	0	0	93	28	9.2	4.5	88
Waller-Duncan													
LSD (k=100)	54	54									0.8	0.4	4
C.V. (%)	(10)	(11)									(8)	(7)	(4)

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

Plant Date: May 6 Maturity Ratings: Aug 25 Vine-Kill Date: Sept 2 Harvest Date: Sept 16

Upstate New York Table 8. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the late maturity trial grown at Freeville, New York - 1998.

Variety/Clone	Plant ¹ Mat. At Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²			
		Shape	Appear.	Total	Sun- Green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.	
Allegany	4.3	2.0	6.0	10.5	5.8	2.0	2.5	0.2	0.0	0.0	0.0	0.0
Atlantic (std)	3.8	1.0	6.9	7.9	3.8	2.7	1.5	0.0	15.0	0.0	2.5	2.5
B0178-34	2.4	6.0	4.9	6.8	3.6	1.9	1.3	0.0	2.5	0.0	2.5	2.5
B0564-8	1.9	1.0	6.0	3.0	1.4	1.3	0.3	0.0	0.0	0.0	0.0	0.0
Elba	5.8	1.0	6.1	9.1	5.1	1.4	2.6	0.1	2.5	2.5	0.0	0.0
Genesee	4.9	1.0	7.0	6.3	5.1	0.9	0.2	0.2	0.0	5.0	0.0	0.0
Katahdin	4.8	2.0	4.8	12.2	7.8	3.4	0.8	0.3	7.5	0.0	2.5	2.5
NY110	2.4	3.0	6.8	14.4	11.7	2.7	0.0	0.0	0.0	0.0	0.0	0.0
NY112	3.9	1.0	6.5	4.4	3.6	0.7	0.0	0.1	0.0	0.0	0.0	0.0
NYL235-4	3.8	2.0	4.1	16.7	8.2	4.1	4.5	0.0	2.5	2.5	2.5	2.5
Pike	2.9	1.0	6.5	4.3	2.4	1.6	0.3	0.0	0.0	0.0	0.0	0.0
Snowden	2.9	1.0	4.8	3.6	1.3	1.5	0.8	0.0	2.5	0.0	0.0	0.0

¹See the standard NE184 rating system for a key to these ratings.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 9. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the red-skinned 2-rep observation trial grown at Freeville, N.Y. - 1998.

Variety/Clone	Total Yield cwt/A	Mkt. Yield cwt/A	% of std	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)			Mean Tuber		Spec. Grav.
				1	2	3	4	5	1 7/8 to 4 in.	2 1/2 to 4 in.	#/ft	wt(oz)		
B0811-4	175	102	27	37	61	1	0	0	0	63	1	6.4	2.8	87
B0852-7	324	287	75	5	45	45	5	0	0	95	50	8.5	4.0	78
B0967-11	438	365	95	1	25	57	12	6	6	93	68	6.7	6.8	84
B0984-1	316	261	68	4	42	39	10	5	5	91	49	6.2	5.3	83
B1102-3	208	140	37	27	71	2	0	0	0	73	2	6.5	3.3	73
B1145-2	266	216	56	17	76	7	0	0	0	83	7	8.0	3.4	64
B1491-5	285	222	58	15	62	20	2	0	0	85	22	8.0	3.7	78
B1492-12	307	211	55	31	64	5	0	0	0	69	5	11.0	2.9	79
B1493-1	289	182	48	30	67	3	0	0	0	70	3	9.6	3.1	83
B1493-3	300	232	61	12	59	29	0	0	0	88	29	7.7	4.0	82
B1495-6	238	190	50	18	77	4	0	0	0	82	4	7.4	3.3	78
B1523-4	360	300	79	10	54	29	6	1	1	89	35	8.7	4.3	78
Chieftain (std)	420	382	100	4	49	40	7	0	0	96	47	8.5	5.1	73
NorDonna	343	291	76	12	72	17	0	0	0	88	17	9.8	3.6	70
Norland, Dark Red	269	214	56	15	60	24	1	0	0	85	25	7.3	3.8	67
Norland, Super Red	312	252	66	8	44	41	5	2	2	90	46	6.4	5.1	59
NY118	393	292	76	11	57	27	5	1	1	89	31	10.1	4.0	66
Red LaSoda	408	345	90	7	39	47	6	2	2	91	53	8.3	5.1	72
Redsen	296	222	58	10	52	36	2	0	0	90	37	7.0	4.4	62

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

Plant Date: May 5

Maturity Ratings: Aug 25

Vine-Kill Date: Sept 2

Harvest Date: Sept 16

Upstate New York Table 10. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the red-skinned 2-rep observation trial grown at Freeville, New York - 1998.

Variety/Clone	Plant ¹		External Tuber Defects (%)						Int. Tuber Defects (%) ²		
	Mat. At Vinekill	Tuber Data ¹		Total	Sun-Green	Mis-shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
		Shape	Appear.								
B0811-4	1.0	2.0	5.0	4.3	0.2	3.3	0.0	0.8	0.0	0.0	0.0
B0852-7	1.0	3.0	7.0	6.6	0.0	2.2	4.5	0.0	10.0	0.0	0.0
B0967-11	1.8	6.0	6.0	9.4	2.4	1.9	5.0	0.1	0.0	0.0	0.0
B0984-1	1.3	2.0	5.5	8.2	0.2	7.3	0.7	0.0	0.0	0.0	0.0
B1102-3	1.0	1.0	6.5	5.9	0.1	2.6	1.3	1.8	0.0	0.0	0.0
B1145-2	1.0	2.0	5.3	2.3	0.6	0.7	1.1	0.0	0.0	0.0	0.0
B1491-5	1.0	1.0	5.0	7.1	0.2	4.4	2.4	0.1	0.0	0.0	5.0
B1492-12	1.5	1.0	6.0	1.4	0.3	0.9	0.2	0.0	0.0	0.0	0.0
B1493-1	1.0	1.0	5.0	7.2	0.5	5.7	0.5	0.4	0.0	0.0	15.0
B1493-3	1.0	1.0	4.5	10.9	0.0	7.0	3.6	0.3	5.0	0.0	0.0
B1495-6	1.0	3.0	6.8	1.8	0.1	1.1	0.6	0.0	0.0	0.0	0.0
B1523-4	1.0	2.0	5.5	5.8	0.1	5.7	0.0	0.0	0.0	0.0	0.0
Chieftain (std)	1.5	3.0	6.5	5.0	1.2	2.9	1.0	0.0	0.0	0.0	0.0
NorDonna	1.0	2.0	5.5	3.4	0.1	3.0	0.1	0.2	0.0	0.0	0.0
Norland, Dark Red	1.0	4.0	4.8	5.4	0.4	2.6	2.4	0.0	0.0	0.0	0.0
Norland, Super Red	1.0	3.0	7.0	9.0	0.0	4.3	4.7	0.0	0.0	0.0	0.0
NY118	3.0	4.0	7.8	14.2	3.5	8.3	2.3	0.2	0.0	0.0	0.0
Red LaSoda	1.0	3.0	4.8	7.2	0.7	4.2	2.3	0.0	0.0	0.0	5.0
Redsen	1.3	2.0	7.3	15.1	0.8	12.2	2.1	0.0	0.0	0.0	5.0

¹See the standard NE184 rating system for a key to these ratings.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 11. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the russet/long tuber variety trial grown at Freeville, New York - 1998.

Variety/Clone	Total		Size Distrib. by Class ¹					Size Distrib. (%)					Mean Tuber		Spec.
	Yield	Mkt. Yield	(% of total yield)					4 to over					#/ft	wt(oz)	
	cwt/A	cwt/A	std	1	2	3	4	5	12 oz	8 oz	12 oz	over			Grav.
A81386-1	368	205	110	20	57	14	5	3	71	23	9		7.7	5.0	83
A84118-3	324	155	83	41	55	3	1	0	58	4	1		8.8	3.8	90
A84180-8	274	166	89	28	54	15	2	1	69	18	3		6.6	4.3	82
A86102-6	379	188	101	34	54	12	1	0	65	13	1		9.4	4.2	88
AF1875-12	150	28	15	41	53	5	0	0	59	5	0		4.6	3.4	74
A082611-7	351	192	103	25	56	15	5	0	71	19	5		7.9	4.6	86
Amey (B9922-11)	357	241	130	16	52	21	9	1	74	31	10		6.7	5.5	87
Century Russet	394	231	124	12	39	33	11	5	72	49	15		6.4	6.4	82
Russet Bake-King	323	253	136	18	59	20	3	0	79	23	3		6.6	5.1	91
Rus. Burbank (std)	377	186	100	25	50	22	3	1	72	26	3		8.4	4.7	83
Russet Legend	290	214	115	11	47	28	11	3	75	42	14		4.9	6.1	80
Russet Norkotah	283	170	91	26	49	18	4	2	67	25	6		6.2	4.8	73
Russet Norkotah-3	307	209	112	20	54	18	7	1	72	26	8		6.5	4.9	82
Russet Norkotah-8	336	210	113	14	45	25	13	3	70	42	16		5.9	6.0	76
Shepody	284	148	79	17	43	25	8	7	68	40	15		5.4	5.5	82
Waller-Duncan															
LSD (k=100)	48	58											0.8	0.8	3
C.V. (%)	(11)	(22)											(9)	(12)	(3)

¹Size classes: 1 = under 4 oz, 2 = 4 to 8 oz, 3 = 8 to 12 oz, 4 = 12 to 16 oz, 5 = over 16 oz

Plant Date: May 1 Maturity Ratings: Sept 7 Vine-Kill Date: Sept 9 Harvest Date: Sept 22

Upstate New York Table 12. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the russet/long tuber variety trial grown at Freeville, New York - 1998.

Variety/Clone	Plant ¹ Mat. At Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²		
		Shape	Appear.	Total	Sun- Green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
A81386-1	5.8	6.0	6.8	21.1	11.7	8.1	0.5	0.8	2.5	0.0	0.0
A84118-3	7.8	6.0	6.5	12.3	10.5	1.6	0.1	0.0	5.0	0.0	0.0
A84180-8	4.5	7.0	6.0	10.6	4.2	6.0	0.4	0.0	2.5	0.0	2.5
A86102-6	6.3	6.0	6.0	17.3	6.6	8.1	2.6	0.0	42.5	0.0	0.0
AF1875-12	1.2	7.0	5.2	37.6	10.0	12.5	14.7	0.4	0.0	0.0	3.3
A082611-7	4.8	6.0	4.8	20.1	4.2	13.2	2.0	0.6	17.5	0.0	0.0
Amey (B9922-11)	5.3	6.0	6.3	14.1	5.2	4.4	4.2	0.3	22.5	0.0	0.0
Century Russet	5.9	8.0	5.9	23.8	16.8	6.4	0.6	0.0	0.0	0.0	0.0
Russet Bake-King	3.4	4.0	6.1	3.9	1.0	1.9	0.4	0.7	0.0	2.5	5.0
Rus. Burbank (std)	5.0	7.9	5.3	25.7	5.7	18.4	1.4	0.2	15.0	0.0	2.5
Russet Legend	6.3	7.0	6.5	12.0	2.2	3.5	6.1	0.1	0.0	15.0	7.5
Russet Norkotah	2.1	7.0	6.3	12.0	3.9	5.5	0.8	1.8	20.0	0.0	0.0
Russet Norkotah-3	4.3	6.0	6.6	10.9	3.7	6.7	0.5	0.0	30.0	0.0	2.5
Russet Norkotah-8	3.6	6.0	6.8	20.5	6.2	13.8	0.6	0.0	7.5	0.0	0.0
Shepody	2.5	8.0	4.8	22.5	9.7	12.6	0.1	0.1	7.5	10.0	0.0

¹See the standard NE184 rating system for a key to these ratings.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 13. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the USDA clone 2-rep observation trial grown at Freeville, N. Y. - 1998.

Variety/Clone	Total Yield cwt/A	Mkt. Yield cwt/A	std	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)			Mean Tuber #/ft	Spec. Grav.
				1	2	3	4	5	1 7/8 to 4 in.	2 1/2 to 4 in.			
				1	2	3	4	5	1 7/8 to 4 in.	2 1/2 to 4 in.			
Atlantic (std)	401	343	100	4	29	44	21	1	94	65	8.5	4.9	91
B1248-5	337	275	80	8	53	31	6	1	90	37	8.1	4.4	76
B1415-7	380	326	95	4	23	60	12	1	95	72	6.1	6.5	85
B1425-9	386	301	88	10	57	32	1	0	90	34	9.5	4.2	95
B1429A-3	351	305	89	10	65	23	2	0	90	24	9.2	4.0	85
Katahdin	373	312	91	5	41	48	6	0	95	54	7.7	5.1	77
Monona	325	281	82	5	49	34	10	3	92	44	6.6	5.1	73
Snowden	403	347	101	9	62	29	1	0	91	29	10.0	4.2	92

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

Plant Date: Apr 30 Maturity Ratings: Aug 21 Mow Vine Date: Aug 28 Harvest Date: Aug 31

Upstate New York Table 14. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the USDA clone 2-rep observation trial grown at Freeville, New York - 1998.

Variety/Clone	Plant ¹ Mat. At Vinekill	Tuber Data ¹ Shape	External Tuber Defects (%)					Int. Tuber Defects (%) ²			
			Total	Sun- Green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.	
Atlantic (std)	3.0	2.0	7.3	8.4	4.9	1.7	1.8	0.0	0.0	0.0	5.0
B1248-5	2.3	4.0	7.8	8.9	4.3	2.3	2.3	0.0	0.0	0.0	0.0
B1415-7	5.5	2.0	5.8	9.4	6.1	0.8	2.6	0.0	25.0	0.0	0.0
B1425-9	2.0	3.0	5.8	12.3	9.5	2.7	0.0	0.0	15.0	0.0	0.0
B1429A-3	1.5	3.0	7.5	2.8	2.1	0.1	0.6	0.0	0.0	0.0	0.0
Katahdin	5.0	2.0	5.5	11.8	9.7	1.5	0.6	0.0	10.0	0.0	0.0
Monona	2.3	4.0	4.0	5.8	3.1	2.1	0.0	0.6	5.0	0.0	0.0
Snowden	3.0	2.0	6.0	4.8	3.7	0.6	0.5	0.0	10.0	0.0	0.0
Superior	1.3	4.0	4.8	10.2	3.9	4.7	1.6	0.0	0.0	0.0	0.0

¹See the standard NE184 rating system for a key to these ratings.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 15. Yield, marketable yield, grade size distribution, tuber number per foot and weight, and specific gravity for the Cornell clones 2-rep obs. trial grown at Freeville, New York - 1998.

Variety/Clone	Total Yield cwt/A	Mkt. Yield cwt/A	Yield % of std	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)				Mean Tuber		Spec. Grav.
				1	2	3	4	5	1 7/8 to 4 in.	2 1/2 to 4 in.	#/ft	wt(oz)			
Allegany	346	293	86	4	50	40	6	0	96	46	7.4	4.8	73		
Atlantic (std)	392	339	100	7	59	30	4	0	93	34	9.0	4.5	88		
Katahdin	359	286	84	3	44	48	5	0	97	52	10.2	3.7	74		
Monona	273	245	72	4	44	42	8	2	94	50	5.6	5.1	66		
Snowden	356	318	94	6	70	22	1	0	94	23	8.9	4.2	88		
Superior	313	261	77	5	61	31	3	0	95	35	6.6	4.9	77		
S14-2	326	262	77	6	59	31	3	0	94	35	7.8	4.3	77		
S28-2	419	365	108	5	56	37	2	0	95	39	9.2	4.7	75		
S32-3	482	418	123	5	60	31	4	0	95	35	10.8	4.7	77		
S33-5	353	323	95	4	40	48	8	0	96	55	6.5	5.6	78		
S111-28	295	249	73	12	69	19	0	0	88	19	7.8	4.0	88		
S300-7	302	273	81	8	66	25	1	0	92	26	8.1	3.9	81		
T2-2	443	373	110	7	40	43	9	1	93	52	9.3	4.9	81		
T3-9	397	344	101	5	44	37	11	3	92	48	8.2	5.0	75		
T3-11	306	261	77	4	48	41	6	1	94	47	6.0	5.3	75		
T4-2	368	314	93	9	72	19	0	0	91	19	9.9	3.9	82		
T4-7	305	259	76	9	74	16	1	0	91	17	8.2	3.9	76		

¹Size classes: 1 = 1" to 1 7/8", 2 = 1 7/8" to 2 1/2", 3 = 2 1/2" to 3 1/4", 4 = 3 1/4" to 4", 5 = over 4"

Plant Date: May 7 Maturity Ratings: Aug 25 Vine-Kill Date: Aug 26 Harvest Date: Sept 23/24

Upstate New York Table 16. Plant maturity, tuber shape and appearance, and external and internal tuber defects for the Cornell clones 2-rep observation trial grown at Freeville, New York - 1998.

Variety/Clone	Plant ¹ Mat. At Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ²		
		Shape	Appear.	Total	Sun- Green	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
Allegany	2.8	1.0	5.8	11.5	6.3	3.9	1.3	0.0	0.0	0.0	0.0
Atlantic (std)	1.3	2.0	5.8	7.0	2.9	2.6	1.6	0.0	15.0	0.0	5.0
Katahdin	4.3	2.0	4.8	16.8	10.6	4.5	1.7	0.0	10.0	0.0	5.0
Monona	1.0	1.0	5.0	4.7	0.8	3.3	0.6	0.0	5.0	0.0	0.0
Snowden	2.0	1.0	3.5	4.1	1.9	2.2	0.0	0.0	5.0	0.0	0.0
Superior	2.5	2.0	4.5	12.1	1.3	9.7	0.6	0.5	0.0	0.0	0.0
S14-2	1.0	2.0	4.0	13.6	3.8	9.8	0.0	0.0	0.0	0.0	0.0
S28-2	1.8	4.0	6.0	7.4	4.3	3.1	0.0	0.0	0.0	0.0	5.0
S32-3	3.0	2.0	7.0	8.0	5.9	1.8	0.3	0.0	0.0	0.0	0.0
S33-5	1.3	1.0	7.3	4.1	0.3	3.6	0.2	0.0	0.0	0.0	0.0
S111-28	1.0	1.0	5.0	4.9	0.9	4.0	0.0	0.0	5.0	0.0	5.0
S300-7	1.0	1.0	7.5	2.0	0.3	1.7	0.0	0.0	0.0	0.0	0.0
T2-2	5.0	2.0	5.0	8.0	4.3	3.0	0.6	0.0	0.0	0.0	0.0
T3-9	3.5	3.0	6.8	5.7	4.4	1.0	0.3	0.0	5.0	0.0	0.0
T3-11	1.8	3.0	6.8	9.0	5.2	3.3	0.0	0.5	10.0	0.0	0.0
T4-2	4.5	1.0	5.5	6.1	4.2	0.9	0.3	0.7	20.0	0.0	0.0
T4-7	1.0	2.0	5.5	6.6	1.7	2.1	2.8	0.0	0.0	0.0	0.0

¹See the standard NE184 rating system for a key to these ratings.

²Based on a 10-tuber sample from each replication. The tubers were taken from size categories 3 and 4.

Upstate New York Table 17. Yield, marketable yield, grade size distribution, tuber number per foot and weight, percentage of external and internal defects, and specific gravity for the Steuben County mineral soil trial grown near Arkport, New York - 1998.

Variety/Clone	Total Yield	cwt/A	Mkt. Yield	Size Distrib. ¹						Mean Tuber		Pct. External			Pct. Internal			Spec. Grav.
				% of		(% of tot. yld.)				wt(oz)	Tuber Defects			Tuber Defects				
				std		1	2	3	#/ft		SUN	KNB	GC	ROT	HH	VD	NEC	
Atlantic (std)	390		295	100	5	83	13	7.9	5.5	3	4	0	0	0	0	0	0	96
Kanona	353		292	99	4	86	10	7.0	5.5	3	1	0	0	0	0	0	0	82
NY103	417		358	121	5	90	5	8.6	5.3	2	2	0	0	0	0	0	0	79
NY110	375		315	107	3	86	11	7.2	5.8	2	0	0	0	0	0	0	0	82
NY112	509		425	144	5	86	9	10.4	5.4	2	0	0	0	0	0	0	0	85
NY115	401		293	99	6	76	19	7.7	5.7	2	0	0	0	0	0	0	0	81
NY119	332		262	89	8	83	9	7.6	4.8	4	0	0	0	0	0	10	0	94
NY120	408		323	110	5	83	12	8.2	5.5	2	1	0	0	0	0	0	0	90
Pike	409		338	115	16	84	0	11.5	3.9	1	0	0	0	0	0	0	0	95
Reba	358		279	95	3	81	16	6.0	6.5	2	0	0	0	0	0	0	0	79
RR17-2	331		293	99	3	90	7	6.5	5.6	1	0	0	0	0	0	0	0	81
RR17-11	368		269	91	2	75	22	6.0	6.8	2	1	0	0	0	0	0	0	76
Snowden	357		299	101	15	85	0	10.6	3.7	1	1	0	0	0	0	0	0	95

¹Size classes: 1 = under 2", 2 = 2" to 4", 3 = over 4"

NOTE: This trial had two replications, except there was only one plot of R17-2 and R17-11.

Plant Date: May 26

Vinekill Dates: September 10, 17

Harvest Date: October 7

Fertilizer: 1500 lb/A 8-16-8 at planting + 45 lb/A N sidedressed.

Vinekill: 2 applications of Diquat 1 pt/A.

Upstate New York Table 18. Yield, marketable yield, grade size distribution, tuber number per foot and weight, percentage of external and internal defects, and specific gravity for the Wyoming County mineral soil trial grown near Hermitage, New York - 1998.

Variety/Clone	Total Yield	Mkt. Yield	Size Distrib. ¹			Mean Tuber	Pct. External	Pct. Internal	Spec.						
			% of	(% of tot. yld.)											
	cwt/A	cwt/A	std	1	2	3	#/ft	wt(oz)	KNB	GC	ROT	HH	VD	NEC	Grav.
Atlantic (std) Kanona	539	470	100	6	88	6	10.9	5.4	1	0	0	10	0	0	95
	487	390	83	3	84	13	8.8	6.1	2	1	1	0	0	0	81
	565	524	111	4	94	1	11.1	5.6	1	0	0	0	0	0	78
NY110 NY112 NY115	549	516	110	4	94	1	10.7	5.7	0	0	0	0	0	0	81
	646	557	118	5	86	8	12.4	5.7	0	0	0	0	0	0	86
	471	399	85	7	85	8	10.3	5.1	0	0	0	0	0	0	83
NY119 NY120 Pike	434	373	79	8	86	6	9.9	4.8	0	0	0	0	0	0	87
	568	525	112	3	93	4	9.6	6.6	1	0	0	0	0	0	89
	482	426	91	11	89	0	12.5	4.3	0	0	0	0	0	0	93
Reba R17-2 R17-11	509	433	92	3	86	10	8.8	6.4	1	0	0	0	0	0	77
	519	485	103	4	93	2	10.3	5.6	0	0	0	0	0	0	77
	552	495	105	3	90	7	9.8	6.2	0	0	0	0	0	0	70
Snowden	539	481	102	8	90	1	13.1	4.5	1	0	0	5	0	0	90

¹Size classes: 1 = under 2", 2 = 2" to 4", 3 = over 4"

NOTE: This trial had two replications, except there was only one plot of R17-2 and R17-11.

Plant Date: May 29

Vinekill Dates: September 18, 25

Harvest Date: October 20

Fertilizer: Plowed down 30 lb/A N to help rot clover sod; broadcast 540 lb/A 12N-0P₂O₅-28K₂O-2.7Mg-0.07B;

banded 961 lb/A 8N-22P₂O₅-7K₂O-0.012Mg-0.03B-0.10Zn at planting.

Vinekill: 2 applications of Diquat 1 pt/A.

North Carolina

G. Craig Yencho and Mark E. Clough¹

Introduction

This work is part of a continuing project designed to evaluate new potato cultivars and advanced clones for potential use by the North Carolina potato industry.

Cooperating Projects

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Dr. Richard Novy, North Dakota State University, Fargo, ND

Dr. Robert Plaisted, Cornell University, Ithaca, NY

Dr. Greg Porter, Porter Seed Farm, University of Maine, Orono, ME

Dr. Al Reeves, University of Maine, Presque Isle, ME

Cooperating NC Agriculture Extension Agents

Tom Campbell, Elizabeth City, Pasquotank Co.

Bill Jester, Kinston, Lenoir Co.

Fred May, Bayboro, Pamlico Co.

Richard Rhodes, Columbia, Tyrrell Co.

NC Research Station and On-Farm Cooperators and Locations

Bright Farms, Weeksville, Pasquotank Co.

Durwood Cooper Farms, Gumneck, Tyrrell Co.

McCotter Farms, Vandemere Pamlico Co.

Mountain Horticultural Crops Research Station, Fletcher, Henderson Co.

Tidewater Research Station (NC Dept.

Agric.)/Vernon G. James Research and Extension Center, (NCSU), Plymouth, Washington Co.

Tull Hill Farms, Kinston, Lenoir Co.

Upper Mountain Research Station (NCDA), Laurel Springs, Ashe Co.

Industry Cooperators

Hettema Seed Potatoes, Fredericton, N.B. Canada

Frito Lays Inc., Rhinelander, WI

Wise Foods Inc., Berwick, PA

Wolf and Wolf International Inc., Orlando, FL

Methods

All trials were planted in a randomized complete block design with 4 replications. The only exception to this was the unreplicated, preliminary evaluation trial, which had only one plot per clone. Each plot consisted of 1 row with 28 hills spaced 9 inches apart, except the russet trial where seed was planted at 12 inches. Spacing between rows was 38 inches at all sites, except UMRS which was 45 inches.

Fertilizer, weed and pest control practices were in accordance with those practiced by the cooperators. Plots were dug using a single row digger and hand harvested. The UMRS trial and all grower trials were graded using a portable Lockwood Grader which sorts into two grades: $\geq 1\frac{7}{8}$ " (= 1's + 2's); and between $1\frac{1}{2}$ " and $1\frac{7}{8}$ " (= 3's). The TRS/VJREC potatoes were graded to three classes: 1's ($> 1\frac{7}{8}$ "); 2's ($= 1\frac{1}{2}$ " to $1\frac{7}{8}$ "); and 3's ($\leq 1\frac{1}{2}$ ").

Each clone was evaluated for tuber quality and appearance comments during grading and while specific gravity measurements were being conducted. After grading and weighing, 40 marketable tubers (10 tubers/replication) were sampled randomly from each entry. The tubers were cut and scored for the presence or absence of hollow heart, heat necrosis severity and any other internal defects. Subsamples of marketable tubers were also taken from each replication and bulked by entry for specific gravity readings and chipping tests. Specific gravity was determined using the weight-in-air/weight-in-water method. Chip colors were provided by Wise Foods, Berwick, PA.

Results

Rainfall levels in the east were slightly higher than average at all sites during March to May. Temperatures were average for much of the season with hot dry conditions intensifying during the later part of June in Eastern NC which caused many clones to senesce earlier than normal. The McCotter's site (southeast) had especially heavy rainfall 1-2 weeks prior to harvest which resulted in high levels of soft rot. In Western NC, the weather was extremely dry and hot for much of the season, resulting in severely reduced yields and early plant senescence.

A total of 251 clones were evaluated by the program during 1998. The data for each trial are summarized in Tables 1-10. Each table has two parts, the first being devoted to yield information and specific

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gravity readings (a), and the second relating potato plant and tuber quality parameters and chip color score (b). A brief summary of each trial is as follows.

Bright Variety Trial (Tables 1a and 1b)

The five highest yielding clones in terms of marketable yield were B0564-8, B0564-9, NY112, Itasca and Snowden. Of these, B0564-8 and B0564-9 had the best appearance scores (8 and 9, respectively) while Itasca and Snowden had the lowest (5). AF1437-1 had unusually high levels of soft rot as was reflected by the high percentage of culls (30.6%). NY117 had the highest specific gravity at 1.076 compared to Atlantic which was 1.074.

Cooper Variety Trial (Tables 2a and 2b)

The five highest yielding clones in terms of marketable yield were Itasca, B0564-9, B1072-21, Century Russet, and AF1437-1. B0564-8, which performed well in most trials in 1998, was the sixth highest yielding. Appearance scores for these clones were Itasca (5), B0564-9 (8), B1072-21 (5), Century Russet (1), AF1437-1 (7) and B0564-8 (7). The levels of soft rot noted in AF1437-1 at Bright's were not observed at this site, but it was noted that this clone had high levels of ECB vine infestation. ND2471-8, which yielded 94% of Atlantic, was noted as having an exceptionally good size distribution and its gravity was about the same as Atlantic (1.078 vs. 1.079 respectively). Both of these clones did not chip particularly well this year because of unexpected delays in transporting the samples to Wise.

McCotter Variety Trial (Tables 3a and 3b)

The five highest yielding clones in terms of marketable yield were NY112, Snowden, B0564-9, Estima, and FL1867. B0564-8 was the sixth highest yielding. Appearance scores for these clones were NY112 (7), Snowden (7), B0564-9 (8), Estima (4), FL1867 (7) and B0564-8 (9). Although Estima yielded well, it had many pointed tubers and too much second growth as is evidenced by the high percentage of culls. FL1867 had the highest specific gravity (1.083) compared with Atlantic (1.080) and it chipped good.

Tull Hill Farms Variety Trial (Tables 4a and 4b)

The five highest yielding clones in terms of marketable yield were B0811-13, Chieftain, Cherry Red, and Red Gold. NorDonna had a very appealing appearance in this trial, but its gravity was rather low at 1.038. Red Gold had problems with heat

necrosis (3 out of 40 tubers with HN scores of 6). B0811-13 yielded well but its heavily netted flesh detracted considerably from its appearance.

VJREC/TRS Round White Trial. (Tables 5a and 5b)

The average marketable yield of Atlantic was 254 cwt/A in this trial. Of the 53 clones entered, 15 had greater marketable yields than Atlantic. The top five of these were R17-7, B1214-7, R17-106, NY112, and MSE149-5Y. Each of these yielded significantly more than Atlantic. Appearance scores for these clones were R17-7 (7), B1214-7 (3), R17-106 (8), NY112 (7), and MSE149-5Y (8). MSE149-5Y had a slight heat necrosis problem with 3 of 40 tubers exhibiting weak HN symptoms (HN=8). Other clones with appearance scores of 7 or greater included: Adora, AF1569-2, Atlantic, B1248-5, B1429A-3, B1449-1, B1625-8, ND2677-10 (but note its HN scores), NY120, R41-11, Snowden, and Superior.

UMRS Variety Trial. (Tables 6a and 6b)

Conditions at the UMRs were extremely dry and all clones senesced early as no irrigation was available at this site. The five highest yielding clones in terms of marketable yield were R17-7, AF1437-1, Atlantic, R17-106 and Snowden.

VJREC/TRS NE-184 White Trial. (Tables 7a and 7b)

The seven highest yielding clones in terms of marketable yield were Kennebec, Atlantic, Niska, Superior, Snowden, B0564-8 and AF1437-1. Appearance scores for these clones were Kennebec (4), Atlantic (7), Niska (5), Superior (6), Snowden (7), B0564-8 (9) and AF1437-1 (6). B0766-3 had an appearance score of 7 but it only yielded 76% of Atlantic. Atlantic had the highest specific gravity at 1.081, while AF1424-7, B0564-8, B0766-3 and Snowden had gravities greater than 1.075, but less than Atlantic. Atlantic, B1004-8, Katahdin, and Yukon Gold had a high incidence of heat necrosis symptoms, while B0766-3, B0856-4, Kennebec, and NY102 had weak heat necrosis symptoms.

VJREC/TRS NE-184 Red Trial. (Tables 8a and 8b)

The five highest yielding red clones in terms of marketable yield were B0984-1, B0811-13, NorDonna, Dark Red Norland and Chieftain. Clones with an appearance score of 7 or greater were B1102-3, B1145-2, Dark Red Norland, ND2224-5R, NorDonna, and Super Red Norland. NorDonna

looked considerably better in the more mineral soils present at Tull Hill Farms compared with the organic soils present at the research station.

VJREC/TRS NE-184 Russet Trial. (Tables 9a and 9b)

Century Russet was the highest yielding clone and, along with B9922-11, it had the highest specific gravity reading at 1.074. Clones A84118-3, A84180-8, and Russet Norkota-3 and -8 had slight problems with heat necrosis. None of the russets tested had appearance scores greater than 5, although B9922-11 makes a somewhat small but attractive, uniform, heavily russeted potato.

Acknowledgements

Without the assistance of the growers, county extension agents and NCDA&CS TRS, MHCRS and UMRS staff, this work could not be conducted. We are grateful for their continued support and assistance. Wise Foods, Berwick, PA is also gratefully acknowledged for conducting chip tests, and for helping to harvest and grade trials. Frito Lays, Inc., Hettema Seed Potatoes, and Wolf and Wolf International provided funds for variety evaluation which benefited the project. Seed for the trials were provided by: Dr. Dave Douches, Michigan State University; Dr. Kathleen Haynes, USDA/ARS, Beltsville, MD; Dr. Richard Novy, North Dakota State University; Dr. Robert Plaisted, Cornell University; Dr. Greg Porter, University of Maine, Porter Seed Farm; Dr. Al Reeves, University of Maine, Aroostook Farm; and from Frito Lays Inc. Hettema Seed Potatoes, and Wolf and Wolf International. This project is funded in part by The North Carolina Potato Growers Association. Their continuing support is much appreciated

NORTH CAROLINA Table 1a. Potato Variety Trial, Bright Farms, Pasquotank Co. Planted 3-13-98 Harvested 7-2-98 (111 DAP)

CLONE	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ¹ (% of total yield)			Specific Gravity ²
				1's + 2's	3's	Culls	
AF1424-7	215	194	84	90.1	4.1	5.8	1.073
AF1433-4	216	186	80	85.3	5.8	8.9	1.062
AF1437-1	165	108	46	64.6	4.9	30.6	1.044
AF1565-12	268	239	103	89.0	6.3	4.7	1.060
Atlantic	263	233	100	88.5	4.7	6.8	1.074
B0178-34	312	255	110	81.8	8.5	9.8	1.070
B0564-8	362	313	135	86.3	8.1	5.6	1.069
B0564-9	343	300	129	87.8	6.5	5.7	1.070
B1415-7	246	232	100	94.3	2.5	3.2	1.066
B9922-11	244	198	87	80.5	10.2	9.3	1.066
BelRus	168	139	60	82.7	11.4	5.9	1.070
Dark Red Norland	186	158	68	85.5	8.4	6.1	1.056
Itasca	314	261	113	82.9	7.3	9.7	1.068
NewLeaf Atlantic	140	124	54	87.9	3.4	8.7	-
NewLeaf Superior	219	175	75	80.0	5.7	14.2	1.058
NY103	274	227	98	82.3	3.5	14.3	1.059
NY112	339	298	129	88.2	4.0	7.9	1.063
NY115	222	207	90	93.1	4.2	2.6	1.062
NY119	278	221	95	79.8	6.4	13.8	1.076
NY120	290	252	109	86.9	3.5	9.6	1.067
Red Gold	226	164	71	72.3	10.1	17.6	1.066
Snowden	284	257	111	90.6	7.4	2.0	1.071
Super Red Norland	175	156	67	89.3	7.9	2.8	1.044
Superior	215	191	83	88.5	4.4	7.1	1.066
Grand Mean	248	212					
CV (%)	24	26					
LSD (p=0.05)	49	48					

¹ Size classes: 1's + 2's \geq 1 7/8"; 3's = 1 1/2" to 1 7/8"; Culls = all defective potatoes.² Determined by weight in air/water method.

NORTH CAROLINA Table 1b. Potato Variety Trial, Bright Farms, Pasquotank Co. Planted 3-13-98 Harvested 7-2-98 (111 DAP)

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Chip ² Color	Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
AF1424-7	6	8	9	4	6	6	5	7	2	8	7	5	0	1	1	2	SR, VD=PR
AF1433-4	5	8	8	5	6	7	4	7	3	7	5	5	0	0	0	3	L SR
AF1437-1	3	9	7	5	2	7	6	6	3	2	5	4	0	0	2	-	L SR, VD=PR
AF1565-12	2	7	6	4	6	5	7	7	2	5	3	7	0	0	0	-	RZ
Atlantic	7	9	9	6	7	5	7	7	1	5	7	7	12	3	0	4	SR, HN=8
B0178-34	8	8	8	4	6	7	5	7	3	7	3	7	3	0	1	4	SR, VD=PR, HN=8
B0564-8	4	8	8	5	6	6	7	7	2	7	5	8	0	0	0	4	SR
B0564-9	6	8	8	6	6	6	7	8	2	6	7	9	0	0	0	-	SR
B1415-7	6	9	9	7	6	7	7	6	2	8	7	8	2	3	0	6	SS, HN=8
B922-11	9	8	8	5	5	2	7	7	7	8	3	5	1	0	0	-	SR, L MS, HN=5
BelRus	8	6	7	6	5	2	7	7	6	8	1	7	0	0	0	-	L CS
Dark Red Norland	3	4	4	2	2	7	7	7	2	4	3	4	0	0	0	-	EB
Itasca	9	8	7	7	6	7	7	6	3	6	7	5	0	1	0	-	L SR
NewLeaf Atlantic	7	8	8	7	6	5	7	7	2	5	7	6	10	6	0	5	L RZ, HN=6, WSTD
NewLeaf Superior	5	9	9	3	6	7	6	7	3	5	5	6	3	0	1	-	WSTD, L SR, L MS, HS
NY103	6	8	8	6	6	7	6	7	4	8	7	8	0	0	0	4	CS, SR, RZ
NY112	8	9	9	4	7	5	7	7	3	7	7	6	2	0	0	4	L SR, CS, HN=8
NY115	3	7	8	4	6	8	6	7	2	8	7	8	0	0	0	4	SR
NY119	8	9	9	4	6	6	5	7	2	8	5	6	2	0	0	4	L SR, HN=8
NY120	7	8	7	5	6	7	4	7	3	7	5	4	0	0	3	4	SR
Red Gold	2	6	5	5	2	7	6	6	3	2	5	3	2	0	0	-	L MS, L SR, YF
Snowden	8	7	6	7	6	5	7	7	2	5	3	5	1	0	0	3	SR
Super Red Norland	3	4	3	1	2	8	7	7	2	6	3	7	2	0	0	-	EB, HS
Superior	4	7	8	3	6	6	5	7	3	6	3	7	0	0	0	-	

¹ See Appendix 1 for plant and tuber characteristic rating codes.² Chip Color Ratings conducted by Wise Foods Inc. 1 = paper white; 4 = acceptable; 5 = barely acceptable; 6 = unacceptable; 9 = black chip.³ Comment codes: BR=bruise; CS=common scab; DAE=deep apical eyes; EB=early blight; ECB= European corn borer; EL= enlarged lenticels; FS=Fusarium; HH=hollow heart; HI= herbicide injury; HN=heat necrosis; GC=growth cracks; HS=heat sprouts; LB=late blight; MS=mishaped tubers; NN=net necrosis; PE=pink eye; PR=pink rot; PLRV=potato leaf roll virus; PTS=very pointed tubers; PS=powdery scab; PVA, PVX, PVY=potato viruses A, X, Y; RZ=Rhizoctonia; SG=secondary growth; SS=sun scald; SR=soft rot; VD= Vascular Discoloration; VW=Verticillium wilt; WSTD=weak stand; YF=yellow flesh Note: L before code indicates high levels; Average HN Rating Scores are noted in comments (Rating Scale: 1 = very severe to 9 = absent).

NORTH CAROLINA Table 2a. Potato Variety Trial, Cooper Farms, Tyrrell Co. Planted 3-16-98 Harvested 7-1-98 (107 DAP)

CLONE	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ¹			Specific Gravity ²
		cwt/A	% Atl.	1's + 2's	3's	Culls	
Adora	241	217	89	89.7	6.1	4.2	1.059
AF1424-7	276	248	102	89.8	8.6	1.6	1.075
AF1433-4	231	215	88	92.7	6.2	1.1	1.070
AF1437-1	305	271	111	88.6	6.4	5.0	1.056
AF1565-12	208	175	72	84.2	13.1	2.7	1.064
AF1668-60	248	221	90	89.3	8.7	2.0	1.070
Atlantic	271	246	100	90.9	7.8	1.3	1.079
B0564-8	298	263	107	88.2	11.1	0.7	1.076
B0564-9	365	333	136	91.2	7.3	1.5	1.071
B0811-13	276	238	97	86.3	11.4	2.3	1.069
B1065-51	232	211	86	91.1	6.3	2.6	1.068
B1072-21	327	310	126	94.7	4.3	1.0	1.063
B1240-1	228	206	84	89.9	8.8	1.4	1.070
Bright	337	255	104	75.8	18.5	5.7	1.067
Century Rus	403	299	121	74.3	9.4	16.3	1.062
Diamond	398	248	101	62.3	22.1	15.6	1.073
Dk Rd Nor	239	202	83	84.5	8.6	6.8	1.055
Fianna	294	205	84	69.5	18.2	12.3	1.069
Itasca	382	346	142	90.8	5.7	3.5	1.067
ND2471-8	263	231	94	87.6	8.1	4.3	1.078
Norvalley	289	239	98	82.8	12.1	5.1	1.068
NY103	278	244	99	88.0	8.9	3.2	1.065
Snowden	260	216	88	83.2	13.8	3.0	1.078
Superior	244	220	90	90.2	5.6	4.3	1.069
Grand Mean	287	244					
CV (%)	19	17					
LSD(p=0.05)	49	46					

¹ Size classes: 1's + 2's \geq 1 7/8"; 3's = 1 1/2" to 1 7/8"; Culls = all defective potatoes.² Determined by weight in air/water method.

NORTH CAROLINA Table 2b. Potato Variety Trial, Cooper Farms, Tyrrell Co. Planted 3-16-98 Harvested 7-1-98 (107 DAP)

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Chip ² Color	Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
Adora	6	8	7	4	6	8	6	6	4	6	7	7	0	0	0	-	YF, MS
AF1424-7	5	8	8	5	8	7	5	4	3	6	5	5	0	0	0	4	
AF1433-4	6	8	9	5	7	6	7	7	2	7	3	7	2	0	0	3	HN=8
AF1437-1	6	7	8	4	7	5	7	7	2	8	5	7	0	0	0	-	S ECB, SR, HS
AF1565-12	2	7	6	3	7	5	4	7	3	7	3	5	0	0	0	-	L SR, L CS
AF1668-60	3	8	9	5	7	6	4	7	3	5	5	6	0	0	3	2	CS
Atlantic	6	8	8	6	7	5	6	6	2	7	5	7	17	1	2	6	HN=6
B0564-8	6	7	8	5	7	5	7	7	2	8	3	7	0	0	0	4	S EB
B0564-9	6	5	8	6	7	5	6	6	3	5	7	8	1	1	0	7	S EB, HS, SR, HN=8
B0811-13	3	7	6	4	2	5	7	6	2	3	5	3	0	0	5	-	L RZ
B1065-51	5	8	8	4	2	5	7	7	3	8	7	6	0	0	0	7	CS, GC
B1072-21	6	8	8	6	7	7	4	5	3	5	5	5	0	0	0	-	PE
B1240-1	6	6	8	5	7	5	5	6	3	6	7	6	0	0	0	7	DAE
Bright	9	9	9	8	7	7	6	5	3	7	1	3	8	0	2	-	SS, L MS, CS, SR, HN=7
Century Rus.	6	9	9	8	6	7	7	7	8	5	5	1	0	0	0	-	L HS, L CS, L MS
Diamond	9	7	8	8	6	7	5	5	3	6	3	3	25	0	0	-	S EB, L SS, L HS, L MS, L CS, L S,
Dk Rd Nor	2	4	3	2	2	7	7	5	3	5	5	7	0	0	0	-	SR
Fianna	9	9	8	8	6	7	5	5	3	8	1	3	7	0	0	-	L HS, L MS, L SS, CS, HN=8
Itasca	9	8	7	7	6	8	7	5	5	7	9	5	0	0	0	7	DAEM MS
ND2471-8	5	8	7	4	6	7	6	5	2	5	3	7	0	0	0	5	SR, NICE SIZE DIST.
Norvalley	6	8	8	5	6	7	6	6	3	7	5	6	0	0	0	5	GC, HS
NY103	6	9	9	6	6	6	6	7	3	8	5	8	1	0	0	5	SR, GC, HN=7
Snowden	9	8	6	7	7	5	7	7	2	5	3	7	2	0	0	6	HN=8
Superior	5	8	8	3	7	6	6	7	3	5	5	7	1	0	0	7	HN=8

¹ See Appendix 1 for plant and tuber characteristic rating codes.² Chip Color Ratings conducted by Wise Foods Inc. 1 = paper white; 4 = acceptable; 5 = barely acceptable; 6 = unacceptable; 9 = black chip.³ Comment codes: BR=bruise; CS=common scab; DAE=deep apical eyes; EB=early blight; ECB=European corn borer; EL= enlarged lenticels; FS=Fusarium; HH=hollow heart; HI= herbicide injury; HN=heat necrosis; GC=growth cracks; HS=heat sprouts; LB=late blight; MS=mishaped tubers; NN=net necrosis; PE=pink eye; PR=pink rot; PLRV=potato leaf roll virus; PTS=very pointed tubers; PS=powdery scab; PVA, PVX, PVY=potato viruses A, X, Y; RZ=Rhizoctonia; SG=secondary growth; SS=sun scald; SR=soft rot; VD= Vascular Discoloration; VW=Verticillium wilt; WSTD=weak stand; YF=yellow flesh Note: L before code indicates high levels; Average HN Rating Scores are noted in comments (Rating Scale: 1 = very severe to 9 = absent).

NORTH CAROLINA Table 3a. Potato Variety Trial, McCotter Farms, Pamlico Co. Planted 3-6-98 Harvested 6-26-98 (112 DAP)

CLONE	Total Yield cw/A	Marketable Yield		Size Distribution by Class ¹			Specific Gravity ²
		cw/A	% Atl.	1's + 2's	3's	Culls	
AF1424-7	275	221	84	80.2	5.3	14.4	1.072
AF1433-4	262	211	80	80.1	11.3	8.6	1.061
AF1668-60	245	207	79	84.5	5.6	9.9	1.069
AF875-15	281	226	86	79.8	8.2	12.0	1.076
Atlantic	317	263	100	83.0	6.7	10.7	1.080
B0178-34	327	260	100	79.6	5.7	14.7	1.075
B0564-8	320	283	108	88.3	8.6	3.1	1.072
B0564-9	366	301	116	79.5	3.9	16.6	1.072
B0766-3	326	261	100	80.2	13.4	6.4	1.063
B1065-51	297	260	99	86.8	6.5	6.7	1.062
B1072-21	259	234	89	90.4	4.9	4.7	1.052
B9922-11	229	185	70	81.0	14.9	4.1	1.063
Century Russet	342	259	97	72.6	7.3	20.0	1.063
Estima	365	293	112	80.2	8.2	11.6	1.061
FL1831	321	270	103	83.6	7.4	9.0	1.080
FL1867	327	284	109	86.9	5.4	7.7	1.083
FL1900	204	173	66	84.6	5.2	10.3	1.076
NY103	260	213	81	81.5	7.6	11.0	1.059
NY112	369	333	127	89.9	5.4	4.7	1.068
NY115	239	192	73	82.1	4.2	13.6	1.069
NY119	283	229	88	81.0	8.4	10.5	1.073
NY120	277	227	86	77.1	2.2	20.7	1.065
Snowden	379	317	120	83.1	14.0	2.9	1.069
Superior	276	247	94	89.4	6.8	3.8	1.064
Grand Mean	298	248					
CV (%)	16	17					
LSD (p=0.05)	72	83					

¹ Size classes: 1's + 2's \geq 1 7/8"; 3's = 1 1/2" to 1 7/8"; Culls = all defective potatoes.² Determined by weight in air/water method.

NORTH CAROLINA Table 3b. Potato Variety Trial, McCotter Farms, Pamlico Co. Planted 3-6-98 Harvested 6-26-98 (112 DAP)

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects —(no./40 tubers)—				Chip ² Color	Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
AF1424-7	3	8	7	6	7	6	5	5	3	8	5	6	0	0	2	SR	
AF1433-4	5	7	7	4	7	6	7	7	3	5	5	7	0	0	4		
AF1668-60	6	7	7	5	7	6	6	7	3	7	5	7	0	0	6		
AF875-15	5	6	5	5	6	7	5	7	2	7	5	6	0	1	4	EB	
Atlantic	6	8	8	6	7	5	7	7	3	8	5	7	4	0	4	SR, HN=8	
B0178-34	7	6	8	6	6	8	5	6	2	8	5	5	1	0	2	SS, GC, HN=6	
B0564-8	4	7	7	6	7	6	7	9	2	6	7	9	2	0	7	EB, HN=8	
B0564-9	6	7	6	6	7	5	7	9	2	6	7	8	0	0	3	SR, EB	
B0766-3	4	7	7	6	7	6	6	8	2	6	5	7	0	1	5		
B1065-51	5	7	5	4	7	6	7	8	6	8	7	6	0	0	4	PTS	
B1072-21	6	8	8	4	6	8	5	7	3	5	7	6	0	0	4	L SS, SECB	
B9922-11	4	7	8	4	5	2	6	7	7	8	1	6	0	0	-		
Century Russet	6	8	8	8	5	4	6	4	7	4	5	5	0	0	-	L SS, L SR	
Estima	5	7	9	6	9	8	5	5	4	8	7	4	2	0	-	L PTS, L SG, MS, YF, HN=8	
FL1831	5	8	8	8	6	6	7	5	2	5	3	7	5	0	4	DAE, SR, HN=7	
FL1867	5	8	8	6	7	6	6	7	2	8	5	7	0	0	3	GC	
FL1900	7	8	8	7	7	6	5	7	3	8	7	8	0	1	4	SS, SR	
NY103	4	7	8	6	7	7	5	7	3	8	3	7	0	0	5	L SR	
NY112	7	8	9	6	7	6	6	6	4	7	7	7	0	1	7		
NY115	4	6	8	5	6	7	6	6	4	6	5	6	0	0	2	HI, L SS	
NY119	7	8	8	7	7	6	6	7	3	5	5	7	0	0	3	SR	
NY120	6	8	8	6	7	7	7	7	2	7	5	6	0	0	7	L SR	
Snowden	8	8	6	7	7	6	6	7	2	6	3	7	0	0	4		
Superior	4	7	8	3	6	6	7	7	2	6	3	6	0	0	5		

¹ See Appendix 1 for plant and tuber characteristic rating codes.² Chip Color Ratings conducted by Wise Foods Inc. 1 = paper white; 4 = acceptable; 5 = barely acceptable; 6 = unacceptable; 9 = black chip.³ Comment codes: BR=bruise; CS=common scab; DAE=deep apical eyes; EB=early blight; ECB=European corn borer; EL=enlarged lenticels; FS=Fusarium; HH=hollow heart; HI=herbicide injury; HN=heat necrosis; GC=growth cracks; HS=heat sprouts; LB=late blight; MS=mishaped tubers; NN=net necrosis; PE=pink eye; PR=pink rot; PLRV=potato leaf roll virus; PTS=very pointed tubers; PS=powdery scab; PVA, PVX, PVY=potato viruses A, X, Y; RZ=Rhizoctonia; SG=secondary growth; SS=sun scald; SR=soft rot; VD=Vascular Discoloration; VW=Verticillium wilt; WSTD=weak stand; YF=yellow flesh Note: L before code indicates high levels; Average HN Rating Scores are noted in comments (Rating Scale: 1 = very severe to 9 = absent).

NORTH CAROLINA Table 4a. Red Variety Trial, Tull Hill Farms, Lenoir Co. Planted 2-27-98 Harvested 6-16-98 (109 DAP)

CLONE	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ¹ (% of total yield)			Specific Gravity
		cwt/A	% Std.	1s	2s	Culls	
B0811-13	210	181	144	85.7	7.7	6.6	1.057
B0811-4	126	84	67	67.3	29.9	2.8	1.066
B0984-1	155	114	94	65.9	5.3	28.7	1.049
Cherry Red	196	167	129	83.8	7.6	8.6	1.054
Chieftain	217	173	138	79.0	7.0	14.0	1.060
Dk Rd Nor	101	76	60	74.5	8.2	17.2	1.049
ND2224-5R	144	104	83	72.4	19.8	7.7	1.056
ND5084-3R	140	120	95	82.7	7.4	9.9	1.051
NorDonna	253	214	171	84.8	12.0	3.3	1.038
Norland	147	119	95	81.4	5.6	13.0	1.060
Red Gold	206	148	118	71.7	15.9	12.4	1.050
Red LaSoda	193	140	112	70.5	4.9	24.6	1.057
Sup Red Nor	168	146	113	85.9	3.5	10.7	1.061
Superior	157	127	100	81.1	3.8	15.1	1.075
Grand Mean	172	137					
CV (%)	24	28					
LSD (p=0.05)	65	62					

¹ Size classes: 1's + 2's \geq 1 7/8"; 3's = 1 1/2" to 1 7/8"; Culls = all defective potatoes.² Determined by weight in air/water method.

NORTH CAROLINA Table 4b. Red Variety Trial, Tull Hill Farms, Lenoir Co. Planted 2-27-98 Harvested 6-16-98 (109 DAP)

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Comments			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP		HN	HH	VD
B0811-13	5	7	9	5	2	5	-	-	2	5	3	5	1	0	2	SR, HN=9
B0811-4	5	7	8	4	3	8	-	-	2	7	1	7	0	0	0	SR
B0984-1	7	8	9	4	2	8	-	-	2	8	5	7	2	0	6	SR, HN=9
Cherry Red	7	9	9	6	2	7	-	-	3	7	3	6	0	0	3	SR, EL
Chieftain	9	9	9	6	3	7	-	-	3	7	7	5	0	0	7	LSR, EL
Dk Rd Nor	4	8	9	3	2	7	-	-	3	4	5	6	0	0	1	LSR
ND2224-5R	7	8	9	2	2	7	-	-	3	6	3	6	0	1	9	SR
ND5084-3R	5	9	9	6	2	8	-	-	2	8	7	7	0	0	4	GC
NorDonna	7	8	9	5	2	7	-	-	3	7	5	8	0	0	2	SR, RZ, SG
Norland	4	8	9	4	4	7	-	-	3	5	5	5	0	0	6	LSR, LSS
Red Gold	6	8	9	5	2	7	-	-	2	7	3	5	3	0	1	SR, MS, YF, HN=6
Red LaSoda	5	8	9	5	3	7	-	-	2	3	5	3	0	1	10	LL SR
Sup Red Nor	6	8	7	2	2	7	-	-	2	4	3	7	0	2	4	
Superior	6	7	9	3	7	6	-	-	2	6	5	7	0	0	0	SR

¹ See Appendix 1 for plant and tuber characteristic rating codes.² Chip Color Ratings conducted by Wise Foods Inc. 1 = paper white; 4 = acceptable; 5 = barely acceptable; 6 = unacceptable; 9 = black chip.³ Comment codes: BR=bruise; CS=common scab; DAE=deep apical eyes; EB=early blight; ECB= European corn borer; EL= enlarged lenticels; FS=Fusarium; HH=hollow heart; HI= herbicide injury; HN=heat necrosis; GC=growth cracks; HS=heat sprouts; LB=late blight; MS=mishaped tubers; NN=net necrosis; PE=pink eye; PR=pink rot; PLRV=potato leaf roll virus; PTS=very pointed tubers; PS=powdery scab; PVA, PVX, PVY=potato viruses A, X, Y; RZ=Rhizoctonia; SG=secondary growth; SS=sun scald; SR=soft rot; VD= Vascular Discoloration; VW=Verticillium wilt; WSTD=weak stand; YF=yellow flesh Note: L before code indicates high levels; Average HN Rating Scores are noted in comments (Rating Scale: 1 = very severe to 9 = absent).

NORTH CAROLINA Table 5a. Round White Trial., TRS/VGJREC, Washington Co. Planted 3-26-98 Harvested 7-7-98 (103 DAP)

CLONE	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ¹ (% of total yield)				Specific Gravity ²
		cwt/A	% Atl.	1's	2's	3's	Culls	
Adora	193	168	66	80.9	6.3	2.0	10.8	1.054
AF1569-2	273	252	100	86.4	5.4	0.7	7.5	1.069
AF1726-9	265	199	78	69.3	6.9	1.8	22.0	1.049
AF1774-2	260	168	66	57.8	6.6	0.7	34.9	1.053
AF1852-1	260	198	78	66.8	9.1	1.6	22.6	1.047
AF875-15	236	214	85	84.3	6.1	0.8	8.8	1.076
Atlantic	268	254	100	89.8	5.2	1.0	4.0	1.074
B1110-1	253	236	93	83.4	10.0	2.3	4.3	1.056
B1214-7	345	322	127	89.2	4.3	0.7	5.9	1.066
B1248-5	265	243	96	81.5	10.3	1.7	6.4	1.069
B1321-21	292	251	98	71.9	14.0	3.6	10.5	1.062
B1338-27	280	250	99	66.3	23.2	3.8	6.7	1.070
B1409-2	294	269	105	82.3	9.7	1.2	6.7	1.070
B1415-7	277	259	103	87.9	5.9	0.8	5.5	1.062
B1429A-3	270	242	96	79.6	9.6	1.5	9.3	1.061
B1449-1	235	224	89	89.5	5.8	1.1	3.6	1.064
B1452-18	341	274	108	76.1	4.6	0.3	18.9	1.054
B1452-9	319	274	107	79.5	5.5	1.0	14.0	1.056
B1477-5	276	254	100	78.6	13.2	1.7	6.5	1.061
B1479-4	188	169	67	78.8	10.9	2.3	8.0	1.064
B1491-20	173	159	63	60.7	31.4	4.4	3.5	1.056
B1624-4	235	215	85	79.5	12.1	1.5	6.8	1.061
B1625-8	286	267	105	87.2	6.4	1.4	5.0	1.066
B1629-8	251	240	95	81.0	14.6	2.6	1.8	1.066
Binjje	309	165	65	15.7	37.2	6.9	40.2	1.060
Bright	238	222	88	70.2	23.2	3.2	3.4	1.061
Carola	275	246	98	66.0	23.4	3.6	7.1	1.063
Diamont	290	222	88	52.8	23.4	5.4	18.4	1.061
Estima	316	202	80	53.6	10.4	1.9	34.1	1.057
Fianna	184	149	58	57.7	22.9	5.9	13.5	1.061

NORTH CAROLINA Table 5a. Continued.

CLONE	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ¹ (% of total yield)				Specific Gravity ²
		cwt/A	% Atl.	1's	2's	3's	Culls	
FL1889	256	214	84	77.5	6.1	0.6	15.9	1.062
FL1930	281	256	101	83.1	7.7	1.5	7.7	1.072
FL1933	244	212	82	67.9	18.0	3.5	10.7	1.068
MSA091-1	285	258	103	83.7	6.8	1.0	8.5	1.068
MSB073-2	221	212	84	80.9	15.1	1.6	2.4	1.066
MSC120-1Y	208	156	61	67.5	7.0	8.4	17.1	1.064
MSE149-5Y	305	286	113	84.6	9.1	1.2	5.1	1.055
MSE221-1	256	221	87	81.2	5.7	0.6	12.5	1.058
MSE250-2	205	189	75	80.6	11.6	1.9	5.9	1.070
ND2676-10	240	215	85	79.9	9.6	1.3	9.2	1.062
NY103	220	183	72	75.6	7.2	0.8	16.3	1.059
NY112	306	294	116	92.0	4.1	0.9	3.0	1.063
NY115	233	217	85	87.1	5.9	0.7	6.3	1.061
NY119	235	224	88	88.7	6.5	1.1	3.7	1.074
NY120	287	279	110	95.6	1.6	0.2	2.5	1.067
R17-106	330	317	126	88.6	7.3	1.3	2.8	1.054
R17-11	205	193	76	90.7	3.5	0.4	5.3	1.047
R17-2	151	147	57	90.1	6.9	0.0	3.1	1.057
R17-7	370	355	140	89.0	6.9	1.0	3.2	1.060
R41-11	279	266	106	86.3	8.7	1.4	3.7	1.061
Snowden	296	284	112	86.3	9.6	1.6	2.5	1.068
Superior	227	217	86	89.8	5.7	1.2	3.3	1.062
Yukon Gold	163	142	56	83.5	3.7	0.7	12.0	1.059
Grand Mean	259	229						
CV (%)	18	21						
LSD (p=0.05)	49	49						

¹ Size Classes: 1 = >1 7/8"; 2 = 1 1/2" to 1 7/8"; 3 = ≤1 1/2"; Culls = all defective potatoes.² Determined by weight in air/water method.

NORTH CAROLINA Table 5b. Round White Trial., TRS/VGJREC, Washington Co. Planted 3-26-98 Harvested 7-7-98 (103 DAP)

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Chip ² Color	Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
Adora	5	6	6	4	6	8	5	7	5	8	7	7	0	0	0	-	YF
AF1569-2	6	7	8	5	7	6	7	5	2	6	5	7	0	0	0	-	
AF1726-9	5	8	7	4	6	6	7	5	3	8	7	4	4	8*	0	-	L GC, L CS, L SR, HN=8
AF1774-2	3	8	8	5	8	7	7	5	4	-	7	3	2	0	0	-	L GC, L MS, HN=8
AF1852-1	4	7	7	4	8	7	7	7	4	3	5	3	19	2*	0	-	L SR, GC, MS, L RZ, HN=7
AF875-15	6	7	6	5	7	6	5	5	2	2	5	5	1	1*	0	-	RZ, HN=8
Atlantic	6	7	8	5	7	5	7	6	2	8	7	7	11	4	0	5	HN=7
B1110-1	5	8	8	5	7	5	6	5	2	6	7	6	4	1*	0	-	HN=8
B1214-7	5	8	9	7	6	6	7	3	4	3	7	3	0	0	0	-	L MS
B1248-5	3	8	8	4	8	7	7	7	2	8	5	7	0	0	0	-	
B1321-21	6	8	8	6	7	5	7	5	2	6	5	6	2	2*	0	-	L CS, GC, HN=7
B1338-27	6	8	8	4	7	6	7	5	3	8	1	6	2	0	0	-	
B1409-2	7	8	9	6	5	3	6	4	7	8	7	4	0	0	0	-	
B1415-7	6	8	8	6	7	5	7	3	2	8	7	4	0	0	0	-	
B1429A-3	5	8	8	4	7	5	7	7	2	8	3	7	0	2	0	-	L MS, CS, HN=8
B1449-1	7	8	8	5	8	6	6	7	5	8	9	7	0	0	0	-	
B1452-18	6	7	8	5	7	5	7	5	5	7	5	5	0	1*	0	-	L GC, L SG
B1452-9	6	8	8	5	7	5	4	7	2	6	5	6	3	1*	0	-	L SG, HN=7
B1477-5	6	7	7	4	6	4	4	4	4	8	5	5	0	0	0	-	L SG
B1479-4	5	7	7	4	9	7	5	7	5	8	5	5	3	1	0	-	HN=8
B1491-21	4	6	4	3	2	6	7	7	2	7	5	6	0	0	0	-	
B1624-4	5	7	7	4	6	6	6	6	5	8	5	6	2	0	0	-	HN=6
B1625-8	6	8	8	5	7	5	6	6	2	8	5	8	0	0	0	-	
B1629-8	6	8	8	5	8	8	5	7	3	8	3	6	5	0	0	-	HN=8
B1629-8	9	8	8	6	9	8	5	7	5	8	1	1	0	0	0	-	L SG
Bintjie	8	8	8	8	9	7	5	5	3	8	5	4	5	0	0	-	L SS, HN=8
Bright	8	8	8	8	8	8	5	5	3	8	5	6	3	3*	0	-	SR, HN=7
Carola	6	8	8	5	8	8	5	7	5	8	5	6	3	3*	0	-	L SR, L MS, CS, HN=6
Diamond	9	8	7	6	6	6	5	4	5	6	1	3	17	7*	0	-	

NORTH CAROLINA Table 5b. Continued.

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Chip ² Color	Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
Estima	9	8	8	7	6	6	6	6	5	8	7	3	21	2*	0	-	L SR, L PTS, GC, SG, CS, HN=7
Fianna	9	8	8	7	9	6	5	5	4	8	3	4	13	3*	0	-	SS, CS, HN=7
FL1889	6	8	9	7	6	5	6	5	2	8	9	5	0	0	0	2	L CS, MS
FL1930	6	7	7	5	7	5	7	6	2	6	5	7	0	0	0	2	L CS, RZ, L SS
FL1933	9	8	8	8	7	5	5	5	3	7	3	4	4	7	0	3	L CS, HN=8
MSA091-1	6	6	7	5	9	5	6	7	3	7	5	5	3	2*	0	2	SS, GC, MS, RZ, HN=8
MSB073-2	6	6	8	5	6	6	6	6	2	7	3	7	0	0	0	3	
MSC120-1Y	6	8	8	5	9	7	6	5	3	7	5	3	2	1	0	-	YF, L GC, CS, HN=8
MSE149-5Y	6	6	6	5	6	7	6	6	2	7	7	8	3	3*	0	-	YF, LENTS, HN=8
MSE221-1	6	7	8	5	7	6	6	7	3	8	7	4	2	1*	0	4	HN=7
MSE250-2	6	7	7	6	6	6	6	5	4	8	1	5	0	2	0	-	CS
ND2676-10	6	7	7	5	8	7	6	7	2	6	3	8	6	3*	0	4	HN=7
NY103	6	8	8	6	8	6	6	6	3	8	5	6	0	6	0	-	L SR, SS
NY112	9	8	8	7	7	5	6	5	3	7	9	7	3	1	0	3	SR, SS, HN=8
NY115	5	8	8	5	9	7	6	6	3	8	5	6	0	0	0	-	
NY119	6	8	8	6	6	6	5	7	2	8	5	6	0	4*	0	-	
NY120	9	7	7	6	5	6	6	5	2	6	9	7	1	1*	0	3	SS, SR, PVY
R17-106	6	6	8	6	9	6	5	7	2	8	5	8	0	0	0	2	SR
R17-11	5	7	7	5	9	7	6	7	2	8	7	6	0	0	0	-	GC, SR, HN=8
R17-2	8	5	8	6	9	7	5	7	2	8	5	6	1	2*	0	-	GC, SS, SR, PVY
R17-7	6	7	8	6	6	6	6	7	3	8	5	7	0	2*	0	4	CS
R41-11	9	8	8	6	6	6	6	6	2	7	5	7	0	0	0	3	
Snowden	6	8	7	6	7	5	6	6	2	7	5	7	0	2*	0	3	HN=8
Superior	5	7	8	4	7	6	6	7	2	5	5	7	3	0	0	3	YF, GC, SR, LENTS, HN=8
Yukon Gold	8	7	7	5	9	7	5	5	4	7	5	6	3	4*	0	-	

* Necrotic center.

¹ See Appendix 1 for plant and tuber characteristic rating codes.² Chip Color Ratings conducted by Wise Foods Inc. 1 = paper white; 4 = acceptable; 5 = barely acceptable; 6 = unacceptable; 9 = black chip.³ Comment codes: BR=bruise; CS=common scab; DAE=deep apical eyes; EB=early blight; ECB= European corn borer; EL= enlarged lenticels; FS=fusarium; HH=hollow heart; HI= herbicide injury; HN=heat necrosis; GC=growth cracks; HS=heat sprouts; LB=late blight; MS=mishaped tubers; NN=net necrosis; PE=pink eye; PR=pink rot; PLRV=potato leaf roll virus; PTS=very pointed tubers; PS=powdery scab; PVA, PVX, PVY=potato viruses A, X, Y; RZ=Rhizoctonia; SG=secondary growth; SS=sun scald; SR=soft rot; VD= Vascular Discoloration; VW=vericillium wilt; WSTD=weak stand; YF=yellow flesh Note: L before code indicates high levels; Average HN Rating Scores are noted in comments (Rating Scale: 1 = very severe to 9 = absent).

NORTH CAROLINA Table 6a. Potato Variety Trial, UMRS, Laurel Springs, Ashe Co. Planted 5-19-98 Harvested 8-26-98 (99 DAP)

CLONE	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ¹ (% of total yield)			Specific Gravity ²
		cwt/A	% Atl.	1's + 2's	3's	Culls	
AF1437-1	179	154	110	86.2	6.7	7.2	1.061
AF1565-12	150	113	79	75.2	6.9	17.8	1.071
AF1569-2	190	123	85	64.7	17.5	17.9	1.070
AF1668-60	122	86	60	70.3	14.9	14.8	1.080
Atlantic (Hgtm)	193	149	100	76.7	10.8	12.6	1.088
Atlantic (USDA)	135	114	78	83.5	3.8	12.7	1.089
B0811-13	83	48	34	59.6	27.8	12.6	1.066
Kennebec	122	75	50	60.3	12.8	26.9	1.071
ND2224-5R	90	59	42	62.8	23.2	14.0	1.061
New Leaf Superior	102	71	50	68.9	5.3	25.8	1.067
R17-106	165	143	104	86.9	4.8	8.3	1.065
R17-11	135	93	67	68.7	10.3	21.0	1.064
R17-2	104	86	59	81.0	5.3	13.6	1.067
R17-7	213	183	130	87.2	4.9	7.9	1.066
R41-11	120	94	64	78.9	9.6	11.5	1.064
Red Gold	123	84	61	67.7	18.1	14.2	1.076
Snowden (Hgtm)	165	143	104	86.2	11.1	2.8	1.079
Snowden (USDA)	169	134	97	79.1	10.1	10.7	1.078
Superior (Hgtm)	84	66	46	78.3	8.1	13.6	1.068
Superior (USDA)	88	70	49	80.3	5.1	14.6	1.067
Yukon Gold	112	79	56	72.1	4.2	23.7	1.075
Grand Mean	135	103					
CV (%)	29	35					
LSD (p=0.05)	48	42					

¹ Size classes: 1's + 2's \geq 1 7/8"; 3's = 1 1/2" to 1 7/8"; Culls = all defective potatoes.² Determined by weight in air/water method.

NORTH CAROLINA Table 6b. Potato Variety Trial, UMRS, Laurel Springs, Ashe Co. Planted 5-19-98 Harvested 8-26-98 (99 DAP)

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./10 tubers)				Chip ² Color	Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
AF1437-1	8	7	7	6	7	6	6	7	3	7	M	5	0	0	0	-	FS
AF1565-12	4	7	6	4	8	6	4	7	3	8	S-M	7	0	0	0	-	HN = 8
AF1569-2	6	6	7	5	8	6	5	7	3	8	S-M	5	6	0	0	-	ED, HN=8
AF1668-60	5	6	7	5	8	6	6	5	4	8	S-M	6	2	0	1	-	HN = 8
Atlantic (Hgtn)	6	7	7	5	7	5	6	7	2	7	M	6	3	0	1	-	HN = 5
Atlantic (USDA)	5	7	7	6	7	5	6	6	2	7	M-L	7	10	2	0	-	L ED, EB, YF
B0811-13	5	6	6	5	2	5	6	7	3	6	S	5	0	0	0	-	GC, HN = 7
Kennebec	9	8	8	8	8	7	5	4	5	8	M-L	5	4	0	0	-	SS, SSC
ND2224-5R	4	4	3	3	2	8	7	7	3	9	S-M	5	0	0	0	-	HN = 7
New Leaf Superior	8	8	8	5	8	6	7	7	3	7	M	7	2	0	0	-	EL, HN = 9
R17-106	7	7	8	7	8	6	5	7	2	7	M-L	7	1	0	0	-	L PVY, CS
R17-11	5	4	6	5	8	6	5	7	3	8	M	6	0	0	0	-	L PVY, FS, HN=9
R17-2	7	3	7	6	9	8	6	7	2	8	M	7	1	0	0	-	PVY, EL, FS
R17-7	6	7	8	7	8	6	5	7	3	7	M-L	7	0	0	1	-	ED, EL, CS, HN=8
R41-11	7	6	7	5	8	7	7	7	2	8	S-M	5	3	0	0	-	EB, ED, CS, YF, HN = 7
Red Gold	6	5	6	5	3	7	7	5	3	8	M	6	5	0	0	-	ED, HN = 9
Snowden (Hgtn)	9	7	5	7	7	5	5	6	2	7	M	7	1	0	0	-	ED, FS, HN = 8
Snowden (USDA)	9	7	5	7	7	5	5	6	2	7	M	7	3	0	2	-	ED
Superior (Hgtn)	4	6	7	3	7	6	6	7	3	7	M	6	1	0	0	-	ED
Superior (USDA)	4	5	6	3	7	6	5	7	3	8	S-M	6	3	0	0	-	ED
Yukon Gold	9	6	7	6	8	7	5	7	3	7	M	6	1	0	1	-	ED, HN = 8

¹ See Appendix 1 for plant and tuber characteristic rating codes.² Chip Color Ratings conducted by Wise Foods Inc. 1 = paper white; 4 = acceptable; 5 = barely acceptable; 6 = unacceptable; 9 = black chip.³ Comment codes: BR=bruise; CS=common scab; DAE=deep apical eyes; EB=early blight; ECB= European corn borer; EL= enlarged lenticels; FS=Fusarium; HH=hollow heart; HI= herbicide injury; HN=heat necrosis; GC=growth cracks; HS=heat sprouts; LB=late blight; MS=mishaped tubers; NN=net necrosis; PE=pink eye; PR=pink rot; PLRV=potato leaf roll virus; PTS=very pointed tubers; PS=powdery scab; PVA, PVX, PVY=potato viruses A, X, Y; RZ=Rhizoctonia; SG=secondary growth; SS=sun scald; SR=soft rot; VD= Vascular Discoloration; VW=Verticillium wilt; WSTD=weak stand; YF=yellow flesh Note: L before code indicates high levels; Average HN Rating Scores are noted in comments (Rating Scale: 1 = very severe to 9 = absent).

NORTH CAROLINA Table 7a. NE184 White Variety Trial, TRS/VGJREC, Washington Co. Planted 3-26-98 Harvested 7-7-98 (103 DAP)

CLONE	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ¹ (% of total yield)				Specific Gravity ²
		cwt/A	% Atl.	1's	2's	3's	Culls	
AF1424-7	222	205	64	85.6	6.7	1.4	6.4	1.077
AF1437-1	291	278	85	88.2	7.2	1.4	3.3	1.053
AF1565-12	164	152	47	78.3	13.7	2.1	6.0	1.058
AF1615-1	288	265	81	85.8	5.8	1.0	7.4	1.062
Atlantic	351	326	100	87.3	5.6	1.1	6.0	1.081
B1004-8	224	205	64	71.2	20.2	4.5	4.0	1.066
B0564-8	295	280	87	88.8	6.1	2.0	3.0	1.077
B0766-3	257	248	76	92.2	4.0	0.9	2.9	1.076
B0856-4	194	180	55	86.7	6.2	0.8	6.3	1.068
Itasca	293	271	84	88.0	3.9	1.2	6.8	1.066
Katahdin	265	247	76	83.8	9.4	2.2	4.6	1.063
Kennebec	377	332	101	80.8	6.8	1.4	11.0	1.068
Niska	312	295	91	88.8	5.8	1.6	3.8	1.070
NY102	273	250	77	81.4	10.3	1.6	6.7	1.069
NY103	229	187	57	75.7	5.3	0.9	18.1	1.064
Snowden	292	281	87	89.6	6.6	1.0	2.8	1.079
Superior	298	284	87	89.9	5.2	1.0	3.9	1.064
Yukon Gold	220	197	61	82.6	7.1	1.3	9.0	1.072
Grand Mean	269	249						
CV (%)	20	21						
LSD (p=0.05)	59	60						

¹ Size Classes: 1 = >1 7/8"; 2 = 1 1/2" to 1 7/8"; 3 = ≤1 1/2"; Culls = all defective potatoes.² Determined by weight in air/water method.

NORTH CAROLINA Table 7b. NE184 White Variety Trial, TRS/VGJREC, Washington Co. Planted 3-26-98 Harvested 7-7-98 (103 DAP)

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Chip ² Color	Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
AF1424-7	6	8	7	6	6	7	4	3	3	8	5	5	0	0	0	3	
AF1437-1	5	6	7	4	7	5	7	6	2	8	7	6	0	0	0	-	
AF1565-12	5	7	6	4	8	6	6	6	4	7	5	6	0	4	0	-	
AF1615-1	7	6	8	6	6	6	5	5	3	8	9	5	0	1	0	5	
Atlantic	8	8	8	6	7	5	6	7	2	6	7	7	12	4	0	5	HN=8
B1004-8	6	8	8	6	4	2	5	5	7	8	3	6	10	1	0	-	HN=7
B0564-8	5	8	8	5	7	5	7	7	2	7	5	9	0	0	0	4	RZ
B0766-3	6	8	8	6	6	5	7	6	2	8	7	7	2	1	0	2	HS, HN=8
B0856-4	4	8	7	5	5	5	6	5	4	8	5	5	3	0	3	-	HN=8
Itasca	8	8	8	7	8	7	6	5	4	7	7	5	0	0	0	7	CS, SG, EL
Katahdin	6	7	7	5	8	7	4	5	3	6	5	6	8	0	0	-	CS, EL, HN=8
Kennebec	9	8	9	8	6	7	5	4	6	5	7	4	4	1	0	-	SG, RZ, HN=7
Niska	4	7	5	5	6	6	6	7	4	6	5	5	0	0	0	5	
NY102	9	5	5	6	8	7	5	7	2	7	5	5	3	0	0	5	CS, EL, HN=8
NY103	9	8	9	5	6	6	7	7	3	8	5	5	0	1	1	4	L SR, EL
Snowden	9	8	7	7	7	5	7	7	2	5	3	7	4	0	0	4	HN=7
Superior	5	7	8	4	7	5	6	7	3	6	3	6	0	0	0	5	
Yukon Gold	9	7	6	6	6	7	5	6	4	8	5	6	5	2	0	-	SR, CS, HN=7

¹ See Appendix 1 for plant and tuber characteristic rating codes.² Chip Color Ratings conducted by Wise Foods Inc. 1 = paper white; 4 = acceptable; 5 = barely acceptable; 6 = unacceptable; 9 = black chip.³ Comment codes: BR=bruise; CS=common scab; DAE=deep apical eyes; EB=early blight; ECB= European corn borer; EL= enlarged lenticels; FS=Fusarium; HH=hollow heart; HI= herbicide injury; HN=heat necrosis; GC=growth cracks; HS=heat sprouts; LB=late blight; MS=mishaped tubers; NN=net necrosis; PE=pink eye; PR=pink rot; PLRV=potato leaf roll virus; PTS=very pointed tubers; PS=powdery scab; PVA, PVX, PVY=potato viruses A, X, Y; RZ=Rhizoctonia; SG=secondary growth; SS=sun scald; SR=soft rot; VD= Vascular Discoloration; VW=Verticillium wilt; WSTD=weak stand; YF=yellow flesh Note: L before code indicates high levels; Average HN Rating Scores are noted in comments (Rating Scale: 1 = very severe to 9 = absent).

NORTH CAROLINA Table 8a. NE184 Red Variety Trial, TRS/VGJREC, Washington Co. Planted 3-26-98 Harvested 6-28-98 (95 DAP)

CLONE	Total Yield cwt/A	Marketable Yield		Size Dist. by Class (%)				Specific Gravity ²
		cwt/A	% Sup.	1's	2's	3'S	Cull's	
B1102-3	177	143	52	48.0	32.5	10.1	9.4	1.067
B1145-2	162	142	52	50.8	36.9	5.9	6.5	1.060
B0811-13	282	265	98	83.8	10.1	2.4	3.7	1.064
B0811-4	99	85	32	31.9	53.2	12.5	2.4	1.083
B0984-1	290	272	99	85.6	7.9	1.7	4.8	1.072
Chieftain	271	191	73	64.9	5.4	1.5	28.2	1.060
Dark Red Norland	226	203	75	79.8	9.9	2.0	8.3	1.062
ND2224-5R	163	137	49	60.2	23.1	4.7	12.0	1.059
NorDonna	242	215	78	75.0	13.8	2.1	9.1	1.058
Red Gold	210	176	64	65.2	18.4	3.3	13.1	1.071
Super Red Norland	166	141	51	71.3	13.2	2.8	12.7	1.048
Superior	306	284	100	87.8	4.8	1.1	6.3	1.070
Grand Mean	216	188						
CV (%)	30	33						
LSD (P=0.05)	58	59						

¹ Size Classes: 1 = >1 7/8"; 2 = 1 1/2" to 1 7/8"; 3 = ≤1 1/2"; Culls = all defective potatoes.² Determined by weight in air/water method.

NORTH CAROLINA Table 8b. NE184 Red Variety Trial, TRS/VGJREC, Washington Co. Planted 3-26-98 Harvested 6-28-98 (95 DAP)

NORTH CAROLINA Table 8b. NE184 Red Variety Trial, TRS/GJREC, Washington Co. Planted 3-20-96 Harvested 6-20-96 (5-Data)																
CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP		HN	HH	VD
B1102-3	4	7	6	4	2	7	7	6	2	8	3	7	0	0	0	RZ, CS
B1145-2	7	5	3	3	2	7	7	7	2	8	1	7	0	0	0	CS
B0811-13	6	7	5	5	2	5	5	7	2	5	3	3	0	0	1	
B0811-4	8	5	6	4	2	8	7	7	2	2	3	6	0	0	0	EL
B0984-1	6	7	7	5	2	5	6	3	2	6	7	5	1	0	0	RZ
Chieftain	8	8	7	6	3	7	5	3	3	5	9	3	0	0	3	L RZ
Dark Red Norland	3	4	4	3	2	7	5	7	3	6	5	7	0	0	0	
ND2224-5R	8	6	5	4	2	8	7	6	5	8	5	7	0	0	0	RZ
NorDonna	8	7	7	4	2	7	7	6	2	8	5	7	0	0	0	RZ, CS
Red Gold	5	6	5	4	0	6	5	7	2	6	5	6	1	0	0	
Super Red Norland	7	4	3	2	2	8	7	4	2	6	5	8	1	0	0	RZ, CS
Superior	6	8	8	5	7	5	6	7	2	5	5	8	1	0	0	

¹ See Appendix 1 for plant and tuber characteristic rating codes.² Chip Color Ratings conducted by Wise Foods Inc. 1 = paper white; 4 = acceptable; 5 = barely acceptable; 6 = unacceptable; 9 = black chip.³ Comment codes: BR=bruise; CS=common scab; DAE=deep apical eyes; EB=early blight; ECB= European corn borer; EL= enlarged lenticels; FS=Fusarium; HH=hollow heart; HI= herbicide injury; HN=heat necrosis; GC=growth cracks; HS=heat sprouts; LB=late blight; MS=mishaped tubers; NN=net necrosis; PE=pink eye; PR=pink rot; PLRV=potato leaf roll virus; PTS=very pointed tubers; PS=powdery scab; PVA, PVX, PVY=potato viruses A, X, Y; RZ=Rhizoctonia; SG=secondary growth; SS=sun scald; SR=soft rot; VD= Vascular Discoloration; VW=Verticillium wilt; WSTD=weak stand; YF=yellow flesh Note: L before code indicates high levels; Average HN Rating Scores are noted in comments (Rating Scale: 1 = very severe to 9 = absent).

NORTH CAROLINA Table 9a. NE184 Russet Variety Trial, TRS/VGJREC, Washington Co. Planted 3-26-98 Harvested 7-6-98 (102 DAP)

CLONE	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ¹ (% of total yield)				Specific Gravity ²
		cwt/A	% Cent. Rus.	1's	2's	3's	Culls	
A81386-1	281	267	89	78.6	16.6	2.3	2.5	1.066
A84118-3	179	163	54	62.9	27.7	6.3	3.1	1.063
A84180-8	221	154	51	41.8	29.2	5.4	23.6	1.060
B9922-11	182	172	57	81.4	13.4	1.7	3.4	1.074
Century Russet	361	302	100	75.0	8.7	3.2	13.1	1.074
Legend	181	158	52	80.5	7.5	2.8	9.3	1.061
Russet Norkota-3	228	197	66	71.6	14.5	2.1	11.7	1.061
Russet Norkota-3117	272	246	82	77.2	13.3	2.1	7.3	1.063
Russet Norkota-8	274	236	79	73.8	12.3	2.3	11.7	1.064
W1099Rus	229	219	72	81.1	14.8	0.7	3.4	1.057
Grand Mean	241	212						
CV (%)	24	24						
LSD (P=0.05)	49	40						

¹ Size Classes: 1 = >1 7/8"; 2 = 1 1/2" to 1 7/8"; 3 = ≤1 1/2"; Culls = all defective potatoes.² Determined by weight in air/water method.

NORTH CAROLINA Table 9b. NE184 Russet Variety Trial, TRS/VGJREC, Washington Co. Planted 3-26-98 Harvested 7-6-98 (102 DAP)

NORTH CAROLINA Table 9b. NE184 Russet Variety Trial, TRS/VGJREC, Washington Co. Planted 5-20-98 Harvested 7-6-98 (102 ears)																
CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP		HN	HH	VD
-	-	-	-	-	5	3	7	5	7	8	5	4	0	0	2*	L PTS
A81386-1	-	-	-	-	5	3	6	4	7	8	3	4	4	2	0	HN=8
A84118-3	-	-	-	-	5	3	7	5	8	8	3	2	4	0	2*	L PTS, HN=8
A84180-8	-	-	-	-	4	2	5	7	6	8	3	5	0	1	0	
B9922-11	-	-	-	-	6	4	7	5	8	8	7	4	0	0	0	PTS, HS
Century Russet	-	-	-	-	6	3	6	5	6	8	5	5	1	0	1	HN=8
Legend	-	-	-	-	5	3	7	3	7	7	3	3	2	0	0	HN=7
Russet Norkota-3	-	-	-	-	5	3	6	6	6	6	5	5	0	0	0	
Russet Norkota-3117	-	-	-	-	5	3	7	5	7	6	5	4	3	0	0	HN=7
Russet Norkota-8	-	-	-	-	5	3	7	5	7	6	5	4	0	0	0	
W1099Rus	-	-	-	-	4	2	5	6	7	8	5	5	0	0	0	

¹ See Appendix 1 for plant and tuber characteristic rating codes.

² Chip Color Ratings conducted by Wise Foods Inc. 1 = paper white; 4 = acceptable; 5 = barely acceptable; 6 = unacceptable; 9 = black chip.

³ Comment codes: BR=bruise; CS=common scab; DAE=deep apical eyes; EB=early blight; ECB= European corn borer; EL= enlarged lenticels; FS=Fusarium; HH=hollow heart; HI= herbicide injury; HN=heat necrosis; GC=growth cracks; HS=heat sprouts; LB=late blight; MS=mishaped tubers; NN=net necrosis; PE=pink eye; PR=pink rot; PLRV=potato leaf roll virus; PTS=very pointed tubers; PS=powdery scab; PVA, PVX, PVY=potato viruses A, X, Y; RZ=Rhizoctonia; SG=secondary growth; SS=sun scald; SR=soft rot; VD= Vascular Discoloration; VW=Verticillium wilt; WSTD=weak stand; YF=yellow flesh Note: L before code indicates high levels; Average HN Rating Scores are noted in comments (Rating Scale: 1 = very severe to 9 = absent).

NORTH CAROLINA Table 10a. Unreplicated Potato Trial, TRS/VGJREC, Washington Co. Planted 3-26-98 Harvested 7-7-98 (103 DAP)

CLONE	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ¹ (% of total yield)				Specific Gravity ²
		cwt/A	% Atl.	1's	2's	3's	Culls	
AZIZA	173	136	53	44.2	34.3	13.2	8.3	1.062
AF1156-14	127	101	39	52.8	26.2	4.1	16.9	1.053
AF1470-6	212	183	71	75.1	11.1	2.5	11.4	1.045
AF1615-1	337	297	115	82.3	5.8	1.0	10.9	1.062
AF1784-1	237	158	61	61.3	5.2	1.1	32.3	1.052
AF1791-1	291	254	98	84.0	3.1	0.2	12.6	1.055
AF1845-7	260	241	94	72.1	20.6	4.8	2.5	1.060
AF1857-2	165	141	55	72.3	13.0	2.0	12.6	1.070
AF1864-36	180	142	55	69.1	9.8	1.5	19.6	1.086
AF1896-2	240	216	84	76.6	13.4	2.7	7.4	1.071
AF1896-5	224	187	73	73.4	10.2	1.2	15.2	1.062
AF1899-1	219	208	81	76.4	18.5	3.9	1.2	1.089
AF1907-6	281	228	89	78.1	3.0	1.2	17.7	1.058
AF1921-5	203	177	69	81.3	6.1	1.6	11.0	1.051
AF1924-1	239	207	80	74.0	12.3	1.4	12.3	1.061
AF1937-4	256	233	91	78.0	13.3	2.3	6.4	1.064
Atlantic	277	258	100	83.5	9.4	1.7	5.4	1.078
B1309-23	56	48	19	67.4	18.6	3.5	10.5	1.070
B1435-15	300	280	109	85.2	8.1	1.3	5.4	-
B1435-37	273	254	98	83.2	9.8	1.7	5.3	1.075
B1440-10	267	228	89	40.3	45.0	8.8	5.9	1.098
B1440-18	337	309	120	85.5	6.2	1.0	7.4	1.058
B1445-7	214	180	70	78.9	5.5	2.1	13.5	1.086
B1450-10	414	353	137	56.3	28.9	6.2	8.7	1.068
B1452-10	254	210	81	71.7	10.8	1.0	16.5	1.061
B1452-19	294	257	100	78.4	8.9	2.0	10.7	1.059
B1452-20	119	84	33	62.6	8.2	2.7	26.4	1.051
B1452-23	218	165	64	66.7	9.3	1.5	22.5	1.061
B1452-3	230	125	48	41.5	12.8	1.1	44.6	1.067
B1463-1	199	186	72	70.8	22.6	1.0	5.6	1.066

NORTH CAROLINA Table 10a. Continued.

CLONE	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ¹ (% of total yield)				Specific Gravity ²
				1's	2's	3's	Culls	
B1478-8	335	291	113	74.2	12.7	1.0	12.1	1.065
B1492-10	210	167	65	46.1	33.3	6.2	14.3	1.053
B1492-12	215	184	72	58.4	27.4	7.6	6.7	1.053
B1492-6	269	198	77	66.2	7.5	0.7	25.5	1.064
B1493-1	208	176	68	58.9	25.4	6.6	9.1	1.065
B1493-3	221	210	82	84.6	10.7	3.0	1.8	1.067
B1493-8	210	191	74	74.1	16.8	3.1	5.9	1.067
B1495-6	124	112	43	68.3	22.2	4.8	4.8	1.065
B1522-6	231	209	81	86.1	4.5	1.1	8.2	1.256
B1566-6	276	236	92	73.3	12.1	2.1	12.5	1.061
B1584-10	296	275	107	86.5	6.2	1.1	6.2	1.080
B1591-1	275	258	100	82.6	11.2	2.6	3.6	1.077
B1598-4	236	225	88	82.3	13.3	2.5	1.9	1.064
B1599-6	391	365	142	73.2	20.2	4.0	2.5	1.077
B1612-2	278	253	98	74.8	16.2	2.8	6.1	1.081
B1625-9	325	292	113	81.7	7.8	1.6	8.8	1.066
B1628-10	288	270	105	90.5	3.4	1.1	5.0	1.054
B1638-9	345	282	110	54.9	26.9	5.1	13.1	1.072
B1639-5	204	168	65	68.3	14.1	3.5	14.1	1.058
B1645-11	349	301	117	73.8	12.5	2.4	11.2	1.068
B1645-14	254	210	82	75.6	7.2	2.1	15.2	1.060
B1652-3	229	163	63	46.0	25.4	1.7	26.9	1.068
B1662-19	120	99	38	34.2	47.8	11.4	6.5	1.066
B1662-2	182	169	65	75.6	16.8	1.4	6.1	1.071
B1700-7	263	237	92	84.6	5.7	1.7	8.0	1.057
B1701-1	320	289	112	82.4	7.8	1.0	8.8	1.064
B1709-4	234	218	85	86.3	7.0	1.4	5.3	1.065
B1709-5	274	255	99	87.4	5.7	0.7	6.2	1.063
B1709-6	339	329	128	90.4	6.7	1.0	1.9	1.067
B1709-7	199	175	68	80.3	7.2	1.0	11.5	1.053

NORTH CAROLINA Table 10a. Continued.

CLONE	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ¹ (% of total yield)				Specific Gravity ²
		cwt/A	% Atl.	1's	2's	3's	Culls	
B1710-8	219	171	66	70.4	7.8	1.8	20.0	1.062
B1712-18	246	241	93	92.6	5.0	1.3	1.1	1.065
B1739-3	210	163	63	44.2	33.6	5.0	17.1	1.070
B1749-1	363	344	134	87.8	7.0	1.4	3.8	1.059
B1749-10	235	214	83	88.6	2.8	1.7	7.0	1.062
B1749-15	292	218	85	67.1	7.4	0.0	25.5	1.062
B1749-5	287	258	100	87.0	3.0	1.1	8.9	1.054
B1749-9	335	306	119	83.2	8.2	2.1	6.4	1.057
B1753-1	199	195	76	81.9	16.1	2.0	0.0	1.070
B1761-10	233	200	78	55.9	30.1	3.1	11.0	1.048
B1761-2	156	113	44	40.2	32.2	10.0	17.6	1.047
Hertha	256	195	76	54.5	21.7	5.1	18.7	1.072
Island Sunshine	204	187	73	73.4	18.3	5.1	3.2	1.060
ND2470-27	369	344	134	84.6	8.9	2.0	4.6	1.069
ND3574-5R	229	182	71	71.7	8.0	1.4	18.9	1.051
NY123	346	319	124	85.8	6.4	0.9	6.8	1.070
NYL235-4	264	230	89	82.2	5.0	0.0	12.9	1.064
Q115-12	216	192	75	75.5	13.3	1.5	9.7	1.072
Q244-6	176	165	64	76.7	16.7	4.4	2.2	1.066
S10-2	219	199	77	87.5	3.3	0.6	8.7	1.068
S14-2	254	243	94	87.4	8.2	2.1	2.3	1.075
S14-3	373	361	140	93.7	3.0	0.0	3.3	1.068
S16-2	334	305	119	86.7	4.7	0.8	7.8	1.074
S17-3	330	311	121	86.3	7.9	1.0	4.8	1.064
S24-2	318	281	109	81.1	7.4	1.0	10.5	1.058
S26-2	361	349	136	91.3	5.4	1.6	1.6	1.069
S27-2	296	197	77	60.0	6.6	1.1	32.2	1.062
S28-2	300	284	110	83.0	11.8	2.4	2.8	1.067
S3-1	240	220	86	86.9	4.9	1.1	7.1	1.062
S300-1	268	257	100	86.1	9.8	1.7	2.4	1.073

NORTH CAROLINA Table 10a. Continued.

CLONE	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ¹ (% of total yield)				Specific Gravity ²
				1's	2's	3's	Culls	
S300-13	329	314	122	85.5	9.7	2.8	2.0	1.069
S300-7	267	259	101	88.0	9.3	0.7	2.0	1.072
S300-9	188	184	71	91.3	6.3	0.0	2.4	1.075
S31-7	233	201	78	76.1	10.4	3.7	9.8	1.063
S32-2	244	229	89	85.8	8.0	2.1	4.0	1.074
S32-3	210	192	75	70.4	21.2	2.5	5.9	1.063
S33-5	233	218	85	85.1	8.7	1.7	4.5	1.068
S34-3	124	102	40	76.2	6.3	1.6	15.9	1.061
S37-6	348	294	114	76.5	7.9	1.5	14.1	1.051
S4-2	329	306	119	83.3	9.7	1.6	5.4	1.058
S4-3	269	252	98	82.7	10.9	1.7	4.6	1.064
Sante	366	240	93	57.5	8.0	1.8	32.7	1.067
Snowden	322	303	118	82.5	11.8	2.4	3.3	1.072
Superior	273	246	95	82.5	7.4	1.4	8.6	1.065

¹ Size Classes: 1 = >1 7/8"; 2 = 1 1/2" to 1 7/8"; 3 = ≤1 1/2"; Culls = all defective potatoes.² Determined by weight in air/water method.

NORTH CAROLINA Table 10b Unreplicated Potato Trial, TRS/VGIREC, Washington Co. Planted 3-26-98 Harvested 7-7-98 (103 DAP)

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Chip ² Color	Comments ³		
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
AZIZA	9	8	7	5	6	6	6	5	3	8	1	5	0	0	0	YF
AF1156-14	9	8	9	8	5	3	5	4	7	-	5	3	0	4*	0	PTS
AF1470-6	3	7	5	4	6	7	6	7	3	8	3	6	0	0	0	-
AF1615-1	6	8	8	6	6	7	6	5	5	7	7	6	1	0	0	HN=8
AF1784-1	3	5	8	4	6	7	6	5	3	8	5	5	0	0	0	ECB, EB
AF1791-1	6	6	9	5	7	6	6	6	3	6	7	6	2	0	0	MLN, SC, HN=8
AF1845-7	3	5	7	5	6	6	6	7	3	8	3	6	0	0	0	-
AF1857-2	6	7	7	5	7	6	5	7	2	8	3	5	0	0	0	-
AF1864-36	6	7	9	5	6	6	6	6	6	7	5	6	0	0	0	ECB
AF1896-2	3	8	6	4	6	6	5	7	4	7	5	6	0	0	0	-
AF1896-5	5	8	8	4	6	7	6	6	3	7	7	5	0	0	0	GC, RZ
AF1899-1	3	8	9	5	6	7	7	5	2	8	3	6	1	0	0	ECB, HN=8
AF1907-6	5	6	7	4	6	7	6	6	3	8	9	7	4	0	0	SC, HN=8
AF1921-5	6	6	8	5	6	6	7	7	3	7	7	7	0	0	0	-
AF1924-1	2	7	7	6	9	7	6	6	3	7	3	6	0	0	0	-
AF1937-4	9	8	7	5	6	6	6	7	2	8	1	6	6	0	0	HN=8
Atlantic	9	8	9	6	7	5	7	7	2	6	7	7	3	0	0	HN=8
B1309-23	5	8	9	5	7	5	7	7	2	8	1	7	10	0	0	HN=7
B1435-15	3	7	6	5	6	6	7	7	2	7	5	7	2	0	0	HN=8
B1435-37	3	8	9	5	6	6	7	5	6	7	5	6	2	0	0	HN=8
B1440-10	9	7	7	4	6	7	6	5	6	7	5	4	0	0	0	-
B1440-18	6	8	8	4	6	7	6	7	4	6	7	7	0	0	0	-
B1445-7	8	8	7	4	9	7	6	6	4	7	7	6	1	0	0	EL
B1450-10	6	8	6	5	6	7	6	6	3	7	3	6	1	0	0	-
B1452-10	3	7	8	6	7	5	5	5	5	7	3	5	0	0	0	-
B1452-19	6	7	5	5	6	5	4	5	5	5	7	5	0	0	0	SS
B1452-20	7	5	6	4	7	6	6	7	5	7	5	5	0	1	0	PTS
B1452-23	5	8	8	5	6	6	5	6	5	6	5	5	0	0	0	PTS
B1452-3	9	7	6	6	5	4	5	7	5	8	3	5	0	0	0	L GC,PTS, HS
B1463-1	8	7	6	5	4	3	6	7	7	8	5	6	0	0	0	-

NORTH CAROLINA Table 10b. Continued.

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Chip ² Color	Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
B1478-8	6	6	5	4	6	7	6	7	4	8	5	6	0	0	0	-	
B1492-10	2	4	5	4	2	7	6	7	2	6	3	5	3	0	0	-	MLN, YF
B1492-12	2	5	6	3	2	7	6	7	2	7	3	6	0	0	0	-	ECB
B1492-6	9	7	5	6	2	6	6	5	2	7	5	4	0	0	0	-	HS, YF, GC
B1493-1	5	6	7	4	2	7	6	7	3	7	5	7	0	0	0	-	RZ
B1493-3	2	4	4	4	2	6	7	6	2	7	3	6	0	0	0	-	MLN, YF
B1493-8	2	5	4	3	2	8	7	6	2	5	3	6	0	0	0	-	YF
B1495-6	2	5	6	3	2	6	5	5	4	8	5	5	0	0	0	-	
B1522-6	5	5	6	4	2	7	6	5	2	2	7	4	3	0	0	-	L SR
B1566-6	6	8	6	5	6	7	6	7	4	5	7	6	3	0	0	-	SC
B1584-10	6	7	8	4	6	6	6	5	3	8	7	5	0	0	0	-	MLN
B1591-1	3	8	8	5	7	6	6	7	3	7	5	7	0	0	0	-	ECB
B1598-4	5	6	5	4	6	6	6	7	2	6	3	6	0	0	0	-	
B1599-6	5	8	9	5	6	6	7	7	2	6	3	7	4	0	0	-	
B1612-2	6	8	8	7	6	7	6	6	3	8	5	7,6	4	0	0	-	EL
B1625-9	9	8	9	8	6	6	6	7	2	8	7	7	0	0	0	-	
B1628-10	6	8	7	5	9	7	5	5	4	6	7	5	0	0	0	-	
B1638-9	3	8	9	6	5	4	6	6	6	8	5	6	3	1	0	-	
B1639-5	3	8	8	4	5	3	6	7	7		1	5	0	0	0	-	HS
B1645-11	3	6	8	4	6	4	6	5	6	7	7	5	0	0	0	-	
B1645-14	2	6	7	4	5	3	7	5	6	9	5	5	0	3	0	-	HS
B1652-3	2	6	7	4	4	2	6	7	7	8	5	5	0	0	0	-	MS
B1662-19	4	8	8	6	5	3	6	5	8	8	5	4	4	0	0	-	
B1662-2	8	8	8	7	7	5	7	6	5	8	5	6	2	0	0	-	
B1700-7	8	6	4	5	6	7	7	6	2	6	5	7	3	0	0	-	
B1701-1	3	8	8	6	6	7	6	5	7	8	5	6	1	0	0	-	PTS
B1709-4	6	8	8	6	7	5	6	6	3	8	7	7	0	0	0	-	
B1709-5	3	8	7	4	6	7	5	7	3	8	5	6	0	0	0	-	
B1709-6	6	8	8	5	6	6	7	6	2	7	5	7	0	0	0	-	
B1709-7	3	7	5	3	6	6	6	6	4	8	7	6	0	4	0	-	L SR

NORTH CAROLINA Table 10b. Continued.

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Chip ² Color	Comments ³			
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
B1710-8	2	8	5	4	6	8	5	6	2	7	5	6	0	0	0	-	EL
B1712-18	8	8	8	6	6	7	6	6	2	8	5	6	0	0	0	-	-
B1739-3	8	7	4	5	6	6	5	5	7	7	5	5	3	1	0	-	HN=8
B1749-1	8	8	8	6	6	6	7	7	3	8	7	7	3	0	0	-	YF, HN=8
B1749-10	9	8	8	7	6	6	6	5	5	7	7	6	0	0	0	-	YF
B1749-15	6	8	8	8	6	7	6	5	4	6	7	5	3	0	0	-	YF, HN=8
B1749-5	6	8	8	7	7	5	7	6	2	7	7	8	6	0	0	-	YF, PVY (1 PLT), HN=8
B1749-9	6	7	8	6	7	5	6	5	5	8	5	7	2	0	0	-	YF, HN=7
B1753-1	7	7	6	4	9	7	6	7	2	7	3	6	0	0	0	-	YF, RZ
B1761-10	6	7	5	5	2	7	6	5	4	8	5	3	4	2*	0	-	HN=7
B1761-2	5	7	4	3	2	7	6	6	5	8	5	5	5	0	0	-	HN=4
Hertha	9	7	8	7	6	7	6	7	3	8	3	6	1	0	0	-	YF, HN=8
Island Sunshine	6	8	8	8	6	6	7	7	2	5	5	7	0	0	0	-	YF
ND2470-27	6	8	7	6	6	6	6	7	3	8	5	7	0	0	0	-	HS
ND3574-5R	5	7	4	3	2	7	6	6	4	8	7	5	0	0	0	-	ECB, RZ, L SVSC
NY123	9	8	8	7	6	7	6	6	2	5	5	5	0	0	0	-	EL, SC, HS
NYL235-4	6	8	8	8	5	6	5	3	2	5	5	3	0	0	0	-	-
Q115-12	9	8	8	7	6	6	7	5	2	4	5	5	0	0	0	-	DAE
Q244-6	8	8	9	6	6	7	7	6	2	8	3	6	0	0	0	-	SC
S10-2	9	5	6	5	6	6	7	7	3	7	5	6	0	0	0	-	MLN, SR
S14-2	8	8	8	5	7	6	6	7	2	7	5	7	0	0	0	-	-
S14-3	9	8	9	8	6	7	5	5	3	7	5	5	0	0	0	-	-
S16-2	6	7	7	5	6	5	6	4	2	6	7	6	0	0	0	-	MLN
S17-3	3	7	8	4	6	6	7	7	2	5	3	7	0	0	0	-	-
S24-2	3	5	4	4	6	7	6	5	4	6	7	6	0	0	0	-	-
S26-2	9	8	6	6	7	6	6	6	5	8	7	7	0	0	0	-	YF
S27-2	6	8	9	6	5	6	6	6	3	8	7	6	0	0	0	-	YF
S28-2	3	8	9	5	6	7	6	7	4	8	3	7	0	0	0	-	YF
S3-1	6	7	5	5	7	5	7	6	2	6	7	7	0	0	0	-	-
S300-1	5	7	5	5	6	7	3	6	3	8	5	5	0	0	0	-	-

NORTH CAROLINA Table 10b. Continued.

CLONE	Plant Data ¹				Tuber Data ¹				Internal Defects (no./40 tubers)				Chip ² Color	Comments ³		
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP			HN	HH	VD
S300-13	6	7	6	6	9	6	6	7	3	7	5	7	0	0	0	-
S300-7	8	8	8	5	9	7	6	7	2	8	5	7	0	0	0	-
S300-9	9	8	9	6	6	7	6	7	2	7	7	7	0	0	0	-
S31-7	9	6	7	5	6	7	6	6	2	7	5	7	3	0	0	-
S32-2	5	8	8	6	6	6	7	7	2	6	5	8	0	0	0	-
S32-3	8	7	8	5	6	6	6	7	2	8	5	6	0	0	5	-
S33-5	8	7	7	5	6	5	7	7	2	8	5	7	0	0	0	-
S34-3	5	6	5	5	7	6	6	7	2	6	5	7	2	0	0	-
S37-6	9	8	8	8	9	7	5	6	5	8	7	5	1	0	0	-
S4-2	3	6	7	5	7	5	6	6	4	7	5	7	0	0	0	-
S4-3	2	7	5	4	9	7	6	7	3	5	5	6	0	0	0	-
Sante	6	7	5	6	6	7	5	7	3	7	5	3	1	0	0	-
Snowden	9	8	6	6	7	6	6	7	2	5	5	6	0	0	0	-
Superior	6	8	8	4	7	6	6	7	3	5	5	6,7	0	0	0	-

¹ See Appendix 1 for plant and tuber characteristic rating codes.² Chip Color Ratings conducted by Wise Foods Inc. 1 = paper white; 4 = acceptable; 5 = barely acceptable; 6 = unacceptable; 9 = black chip.³ Comment codes: BR=bruise; CS=common scab; DAE=deep apical eyes; EB=early blight; ECB= European corn borer; EL= enlarged lenticels; FS=Fusarium; HH=hollow heart; HI= herbicide injury; HN=heat necrosis; GC=growth cracks; HS=heat sprouts; LB=late blight; MS=mishaped tubers; NN=net necrosis; PE=pink eye; PR=pink rot; PLRV=potato leaf roll virus; PTS=very pointed tubers; PS=powdery scab; PVA, PVX, PVY=potato viruses A, X, Y; RZ=Rhizoctonia; SG=secondary growth; SS=sun scald; SR=soft rot; VD= Vascular Discoloration; VW=Verticillium wilt; WSTD=weak stand; YF=yellow flesh Note: L before code indicates high levels; Average HN Rating Scores are noted in comments (Rating Scale: 1 = very severe to 9 = absent).

Appendix 1: RATING CODES FOR PLANT AND TUBER CHARACTERISTICS

Tuber Color

1. purple
2. red
3. pink
4. dark brown
5. brown
6. tan/light brown
7. buff
8. white
9. cream

Tuber Texture

1. partial russet
2. heavy russet
3. moderate russet
4. light russet
5. netted
6. slight net
7. moderately smooth
8. smooth
9. very smooth

Tuber Cross-section

1. very flat
2. --
3. flat
4. --
5. intermediate/oval
6. --
7. mostly round
8. --
9. very round

Tuber Skin Set

1. very poor
- 2.
3. poor
- 4.
5. fair
- 6.
7. good
- 8.
9. excellent

Tuber Shape

1. very round
2. mostly round
3. round to oblong
4. mostly oblong
5. oblong
6. oblong to long
7. mostly long
8. long
9. cylindrical

Tuber Eye Depth

1. -
2. deep
3. +
4. -
5. medium
6. +
7. -
8. shallow
9. +

Tuber Size

1. small
2. -
3. small-medium
4. -
5. medium
6. -
7. medium-large
8. -
9. large

Tuber Appearance

1. very poor
2. --
3. poor
4. --
5. fair
6. --
7. good
8. --
9. excellent

Tuber Disease Rating

1. very severe
- 2.
3. severe
- 4.
5. moderate
6. borderline
7. slight
8. very slight
9. none

Plant Type

1. decumbent-poor canopy
2. decumbent-fair canopy
3. decumbent-good canopy
4. spreading-poor canopy
5. spreading-fair canopy
6. spreading-good canopy
7. upright-poor canopy
8. upright-fair canopy
9. upright-good canopy

Plant Disease and Pollution Reaction

1. Dead
2. -
3. severe
4. +
5. moderate
6. +
7. -
8. slight
9. none

Maturity at Vinekill

1. --
2. early
3. +
4. --
5. medium
6. +
7. --
8. late
9. +

NORTH DAKOTA POTATO VARIETY TRIALS AND BREEDING REPORT

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Crossing and Seedling Production: In 1998, 2,840 crosses were made in the greenhouse producing 538 seedling families. Twenty-six percent of the families had one or more parents that were identified as having late blight resistance. During the summer of 1998, 118,752 seedlings were grown for minituber production. Twenty-three percent of the seedlings planted for tuber production in 1998 had one or more parents that were identified as having late blight resistance. Selected clones with late blight resistance in their background will be evaluated in the winter of 1998-99 for resistance.

1st Year Selections: Approximately 115,400 red, white, and russet-skinned seedlings were grown at the Langdon Agricultural Experiment Station. Seedlings were planted on May 13 and 19-20 at Langdon. Evaluation and harvesting was conducted during the second week of October at Langdon.

Advanced Selections: Replicated plantings of 1,215 second year selections from the 1997 seedling crop were planted at McLeod and Absaraka. A total of

200 second-year selections were saved at harvest from both sites. Of the advanced material (>2 year material), 450 selections were planted and 253 were saved at harvest. Third year and older selections were planted at the Casselton Agronomy Seed Farm for clean seed stock production and at McLeod and Crookston for evaluation and selection.

Cultivar and Advanced Selection Yield Trials:

Trials were conducted under dryland conditions at the Northwest Experiment Station at Crookston, MN and at Park River, ND. In addition, two irrigated trials were established in growers' fields near McCanna and McLeod, ND. Spacing, fertility, planting and harvest dates are listed in North Dakota Table 1. The four trials, with a few entry differences, were replicates of one another. They consisted of standard and newly released varieties, and advanced NDSU and Idaho selections. The replication across sites allowed for the assessment of the potato selections and cultivars under both dryland and irrigated conditions.

The McLeod site also consisted of two additional trials -- a secondary trial consisting of additional promising ND selections, and an out-of-state trial consisting primarily of entries from Texas and Europe. Rainfall during May and June of 1998 was excessive at McLeod, with 11.5" rainfall during May and June. In the previous 4 years, an average rainfall amount during that time period was 4.2". Three of four replications of the secondary trial were lost to flooding, the results of which are not presented in this report. The remaining two trials at the McLeod site, the primary and out-of-state trials, had flooding in 10% of their plots. Fourteen percent of the plots in the primary trial at the Crookston site also had flooding. The abnormally low yields in these flooded plots are not indicative of the true merit of the entries under normal growing conditions, and data from these flooded plots were not included in the final statistical analysis.

Entries in each of the four sites consisted of 20 hills, replicated four times in a randomized complete block design.

Irrigated Sites

McCanna: The average total yield of the 25 entries at the McCanna site was 347 cwt/A. Average U.S. No. 1 yield was 303 cwt/A. Red Pontiac and ND5822C-7 were the highest yielding entries with U.S. No. 1 yields (cwt/Acre) of 468 (North Dakota

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Table 2). ND5822C-7 is a white chipper with uniform, attractive tubers and resistance to the Colorado potato beetle. Entered for the first time in the primary state trials, ND5822C-7 significantly outyielded all chipping cultivars by 100 cwt/A or more. Two other ND chipping selections, ND2676-10 and ND5775-3 also yielded well with 371 cwt/A and 393 cwt/A, respectively.

After Red Pontiac, ND5084-3R was the next highest yielding red at 376 cwt/A. This selection was the highest yielding red entry at McCanna in 1997. While similar to Red Pontiac in yield, ND5084-3R generally has a smaller percentage of tubers in the >3.5" range.

In the russet/long white category, Shepody and Russet Norkotah were the highest yielding at 353 and 330 cwt/A, respectively. A79180-10, an Idaho selection, followed closely at 328 cwt/A. A79180-10 had been the highest yielding russet entry in the McCanna trials in the previous two years. A79180-10, which was rated quite highly for french fry production in 1995, received lower but acceptable ratings in 1996 and 1997 (North Dakota Table 8).

McLeod:

Primary Trial: The average total yield of the 26 entries at this site was 295 cwt/A. Average U.S. No. 1 yield was 247 cwt/A. ND5084-3R, a red selection, was the highest yielding entry with a U.S. No. 1 yield of 374 cwt/A (North Dakota Table 3). The next highest-yielding, red-skinned entries were Red Pontiac at 295 cwt/A and ND5002-3R at 274 cwt/A. Duplicating its performance in the McCanna trial, ND5822C-7 was again the highest -yielding chipping selection at 339 cwt/A, followed closely by Atlantic at 333 cwt/A. Chipping selection ND5775-3 also yielded well at 320 cwt/A.

Russet Norkotah was the highest yielding russet entry for U.S. No. 1's at 320 cwt/A, significantly outyielding the next highest yielding russet entry, A79180-10, by 89 cwt/A.

Out-Of-State Trial: This trial is designed for the evaluation of new cultivars and advanced selections from other breeding programs. Promising selections are moved to the secondary and primary state trials in subsequent years. The average total yield of the 20 entries was 281 cwt/A. Average U.S. No. 1 yield was 212 cwt/A. Norchip and the European cultivar Morning Gold, a cultivar of the De Z.P.C seed

company, were the top yielders with U.S. No. 1 yields of 342 and 341 cwt/A respectively, followed closely by Latona at 328 cwt/A (North Dakota Table 4). Morning Gold is a yellow-skinned, light yellow-fleshed, tablestock cultivar with good storage characteristics. Latona, another De Z.P.C. entry, is a tablestock variety having oval tubers with a light-yellow flesh.

Non-Irrigated Sites

Crookston: Utilized for the first time as a dryland trial site, the average total yield for the 27 entries in the primary state trial at Crookston was 237 cwt/A. Average U.S. No. 1 yield was 206 cwt/A. Russet Norkotah and Norchip tied for first place with U.S. No. 1 yields of 316 cwt/A (North Dakota Table 5). ND2676-10, a cold-sweetening resistant, chipping selection was the second-highest yielding entry at 286 cwt/A.

Among red-skinned entries, ND3574-5R and ND5084-3R led with U.S. No. 1 yields of 257 and 254 cwt/A, respectively. The tuber size distribution between the two entries was almost identical, with a substantially smaller percentage of > 3 1/2" tubers as compared to Red Pontiac.

Park River: Last used as a test site in 1994, a trial was again established at Park River in collaboration with Brad Brummond, Walsh County Extension Agent in 1997. Initial progress of the primary trial in 1998 was very good. However, a lack of timely insecticide applications in Mid-June resulted in some severe Colorado potato beetle feeding damage. The extent of the damage was such that any yield data obtained following the control of the beetle population would be confounded by beetle defoliation. The trial was allowed to progress as a screening of potato clones for resistance to Colorado potato beetle, with no further application of insecticides.

Differences among clones were striking when defoliation readings were taken on July 9 (North Dakota Table 6), especially with respect to ND5822C-7, a white chipping selection with acceptable tuber type and yield that had been bred for resistance to the Colorado potato beetle. Whereas, several cultivars and selections had >70% defoliation, ND5822C-7 displayed less than 10% defoliation. Statistical analysis of the defoliation data showed no significant differences among

replications, indicating beetle populations were effectively dispersed throughout the trial. Under the intense beetle populations at Park River, all clones were defoliated by the last week of July. The trial was rotobeat on August 6, 108 days after planting, and harvested on August 12 to assess yield potential and how it correlated with beetle resistance.

NorValley, known to have non-preference resistance to Colorado potato beetle, and ND5822C-7 were the two top yielding entries with total yield of 166 and 160 cwt/A, respectively. Red Pontiac was third at 154 cwt/A (North Dakota Table 6). The relatively high yields of ND5822C-7, a later-maturing selection than NorValley or Red Pontiac, would indicate that its resistance to Colorado potato beetle was instrumental in its achievement of higher yields. A highly significant negative correlation ($r = -0.58$) was found between yield and defoliation ($\text{prob} > r$ was 0.0001) in the Park River trial. Further studies of ND5822C-7 are planned in 1999 to ascertain the mechanism(s) that confer resistance to Colorado potato beetle.

Summary: The overall performance of the entries at the McCanna, McLeod and Crookston sites have been summarized in North Dakota Table 7.

Processing Trials

French Fries: Samples were tested for french fry qualities by the Food and Nutrition Department using two taste-panels comprised of 6 panelists. Sensory characteristics evaluated were fry color, flavor and texture (North Dakota Table 8). All sensory scores for these three characteristics were based on 6 separate panel evaluations of each cultivar from the McCanna and Oakes sites, and 3 panel evaluations at the Grand Forks site. With six panelists at each evaluation, sensory scores are therefore an average of 36 and 18 individual evaluations. Exceptions were the Grand Fork entries, Dali, Rikea, SW91102, Russet Burbank, and Fianna which were represented by 36 evaluations (rather than 18), and the control / reference samples of Russet Burbank (included at each panel evaluation) for which sensory scores are an average of 228 individual evaluations.

Averaging the scores obtained for color, texture, and flavor, allowed a relative ranking of entries (North Dakota Table 8). The Idaho-Texas clone, ATX9201-

1Russ had the highest ranking among all entries, followed closely by ND5343-1Russ, ND4027-4Russ, Agria, Russet Burbank, COO83008-1 (Legend), and Fianna. All remaining entries had acceptable scores with the exception of TXNS278 (A genetic variant of Russet Norkotah selected by the Texas breeding program), and the two Idaho-Texas selections ATX9204-2Russ and ATX87262-2Russ.

Baking, Boiling and Microwaving: Tubers of 29 potato clones from the Park River (dryland) trial, 35 clones from the irrigated trial at McCanna, and an additional 5 clones from the Oakes irrigated trial in 1997 were evaluated for the following sensory characteristics in each of three cooking categories by a taste panel of seven:

Boiling: Characteristics examined were color immediately and four hours after cooking, mealiness, and flavor.

Baking: Mealiness, color, and flavor were evaluated.

Microwaving: Mealiness, color, and flavor were evaluated.

Two replications of sensory data were taken for each entry. The summation of scores at the Park River (dryland) site across all three cooking categories identified the following top 10 cultivars and advanced selections: ND3196-1R, A79180-10, Atlantic, ND860-2, Shepody, A82119-3, N8-14, Red Pontiac, Red Norland, and Goldrush.

A similar summation of sensory scores of the 39 clones from the McCanna and Oakes irrigated trials identified the following top 10 cultivars and advanced selections: N8-14, Agria, Sante, ND4027-4Russ, Shepody, Lili, A79180-10, Russet Burbank, Fianna, and Atlantic.

Top sensory-rated clones in 1997 that also were rated in the top ten in 1996 were: Shepody, A79180-10, ND4027-4Russ, Atlantic, Russet Burbank, and N8-14.

Chipping: In collaboration with the East Grand Forks Potato Worksite, selections and cultivars are assessed for their resistance to the accumulation of reducing sugars following storage at 43°F (North Dakota Table 9). Of the 38 entries analyzed, only NorValley, ND2676-10, N8-14, and ND3828-15 chipped acceptably (Agtron value ≥ 55) directly from 43°F. Surprisingly, ND860-2, a clone well known for its cold-sweetening resistance did not meet the

acceptable criteria with its reading of 52. Other selections and cultivars worthy of mention in that they direct chipped within a range of 50 - 55 and reconditioned acceptably were: Snowden, NDO1496-1, ND860-2, ND2470-27, ND3636-1, ND3647-6, ND4778-2, ND2676-12 (a full-sib of ND2676-10), ND5775-3, and SW91102. ND3636-1, ND3647-6, and ND3828-15 are no longer being considered for release as cultivars.

Promising Selections--Summary for 1998

White Chippers

ND5822C-7: Entered for the first time in the primary state trials in 1998, this selection was the highest yielding chipping entry in both the McCanna and McLeod irrigated trials with an average U.S. No. 1 yield across the two sites of 404 cwt/A; an average of 89 - 121 cwt /A greater yield than the chipping cultivars entered in the same two trials. Under dryland conditions at Crookston, it yielded 225 cwt/A, placing it fifth among the 10 chipping entries. This medium-late maturing selection produces round tubers, is very uniform in size, with specific gravities typically in the mid 80's to low 90's. In preliminary trials it does appear to have some cold-sweetening resistance, and was shown at the Park River site in 1998 to have resistance to Colorado potato beetle.

ND5775-3: Also entered for the first time in the primary state trials in 1998, this selection averaged 357 cwt/A across the two irrigated trials, and 223 cwt/A at the dryland trial at Crookston. While high-yielding, its tuber size tended to be in the smaller size categories, with the majority of its tubers being <2.5" in size.

ND2676-10: This medium maturing selection produces uniform, attractive tubers, and has cold-sweetening resistance. Specific gravity is generally in the low - mid 80's. It was entered in the North Central Regional Potato Variety Trial (NCRPVT) for the third year in 1998. In the 1996-1997 NCRPVT trials (comprising a total of 11 sites) its average U.S. No. 1 yield was 249 cwt/A compared to Snowden at 281 cwt/A, Norchip at 234 cwt/A, and Atlantic at 288 cwt/A. Its average U.S. No. 1 yield under irrigation in ND trials in 1998 was 314 cwt/A, placing it fourth among the ten chipping entries. At Crookston it was the second-highest chipping entry at 286 cwt/A. In the past it had been noted for erratic yields that were thought to be due to poor quality seed. Higher quality seed has since been

used with an associated improved performance.

ND2470-27: One of the highest yielding chippers in the irrigated trials in 1996, and the highest-yielding white chipper at both Oakes and McCanna in 1997, ND2470-27 did not perform as well in the 1998 trials. Average U.S. No. 1 yield across the two irrigated sites in 1998 was 257 cwt/A. At Crookston, it ranked fourth among the 10 chipping entries at 226 cwt/A. ND2470-27 has cold chipping properties and could be used as tablestock with high sensory ratings for boiling, baking, and microwaving in 1995 - 1997. It was entered for the first time in the 1998 North Central Regional Potato Variety Trial.

Red Selections

ND5084-3R: As in 1997, ND5084-3R was among the highest yielding red selections in 1998. Its U.S. No. 1 yield averaged over the ND irrigated sites was 375 cwt/A, as compared to Red Pontiac at 382 cwt/A. Under dryland conditions, it yielded 254 cwt/A, 13 cwt/A higher than Red Pontiac. While yielding similarly to Red Pontiac, its tuber type and color are smoother and deeper red. It also tends to have a lower percentage of tubers in the >3.5" diameter size than Red Pontiac. While it has many positive attributes, it apparently does have a weakness with respect to stolon adhesion or "clinging" stolons, which may limit its potential as a cultivar.

ND5002-3R: Entered for the first time in the primary state trials in 1998. This selection has tubers with typically a deep red skin color and round shape. This year, skin color seemed to be affected by silver scurf. Yields in its first year were good with U.S. No. 1 yields of 299 cwt/A for the irrigated sites making it the third-highest yielding red entry. Under dryland conditions at Crookston it yielded 205 cwt/A—slightly higher than Dark Red Norland.

ND3574-5R: A higher-yielding, red selection with round-oblong, deep red tubers and an early maturity similar to Red Norland. Average U.S. No. 1 yield under irrigated conditions in 1998 was 232 cwt/A—much lower than Red Pontiac, but considerably higher than the yields of Red Norland, Dark Red Norland, or NorDonna. Under dryland growing conditions at Crookston, it was the highest yielding red-skinned entry at 257 cwt/A. Growers have commented that it seems to retain its skin pigmentation in storage without fading.

ND3196-1R: With a yield and maturity similar to Red Norland, ND3196-1R has a very nice round shape and a darker skin color than Red Norland. Under irrigation in 1998, it averaged 230 cwt/A, very similar to yields observed for NorDonna, Red Norland, and Dark Red Norland. At the Crookston site, it again yielded similarly to other earlier-maturing red cultivars with a U.S. No. 1 yield of 174 cwt/A.

ND2225-1R: An early-maturing selection with good tuber type, deep red skin, and bright white flesh. Based upon a variety release meeting earlier this year, the decision was made not to release it as a cultivar. The primary reason for this decision was ND2225-1R's propensity to develop russeted skin or "buckskin" under heavier, acidic soils, and its susceptibility to tuber early blight. In peat soils, irrigated sandy soils, and heavy acidic clay soils, the skin russetting is not pronounced, and ND2225-1R can be quite attractive. This selection has found a niche with certain growers in MN and ND, and done well in trials conducted by Pennsylvania State University. This selection will no longer be included in ND yield trials after this year.

Russets

A79180-10: This Idaho selection was the highest yielding russet at McCanna in 1996 and at McCanna, Oakes, and Park River in 1997. In the 1998 trials, its U.S. No. 1 yield across all irrigated sites was 280 cwt/A, placing it third among the entries in the Russet / Long White category behind Russet Norkotah and Shepody. It placed fifth among entries at Crookston with a yield 167 cwt/A. In 1995 it had excellent french fry evaluation score--somewhat lower but acceptable in 1996 and 1997. It has consistently scored well for sensory qualities and could be a dual-purpose selection. However, its lightly-russeted skin, may limit its use for tablestock.

ND4093-4Russ: While not as high yielding as A79180-10 or Russet Norkotah, its yield has compared favorably with Russet Burbank or Goldrush. In 1998, it averaged 230 cwt/A under irrigation and 233 cwt/A in the Crookston dryland trial. It is a medium maturing selection with nice tuber type and excellent russetting. In french fry sensory evaluations it is usually ranked similarly or higher (in 1998) than Russet Burbank for fry color, taste, and texture. However, its lower specific gravity may limit its use for processing.

Germplasm Enhancement Update

A major objective of the NDSU program is the incorporation of resistance to the newer genotypes of *Phytophthora infestans*, such as the US-8 genotype that predominates in North Dakota. Crosses utilizing parents with genetic resistance to late blight continued this past winter and their progeny were grown in the greenhouse this past summer. Several new sources of late blight resistance were incorporated into the crossing program. Of special merit was the Scottish potato cultivar Stirling, a round white cultivar having late blight resistance and tubers that size well under our North Dakota conditions. Further selections were made within late blight resistant families this fall at Langdon, with several putative resistant selections displaying cultivar qualities. These and other more advanced clonal selections will be grown in the greenhouse this winter and evaluated for late blight resistance in collaboration with Drs. Gary Secor and Neil Gudmestad of the Plant Pathology Department at NDSU.

Field testing of material for late blight resistance also was conducted at Prosper, ND this past summer in collaboration with NDSU Plant Pathology. Plots at Prosper were planted July 15 with greenhouse - grown plants inoculated with the US-8 genotype, to act as a source of inoculum in the field. The entire field was then sprayed with water that same night to aid in the development of the disease. Following inoculation, the season was warm and dry, and late blight pressure was not as great as in past years. However, late blight did appear by late August, allowing differentiation among clones for resistance/susceptibility.

Eighty entries consisting of selected ND breeding clones with one or more resistant parents, new European cultivars, and potato clones with known resistance to late blight were evaluated in 5 hill, unreplicated plots. Readings were taken of percent necrotic tissue at the end of August, with many clones showing very good resistance. At the end of September the hills of resistant clones were dug and tuber qualities evaluated. Resistant clones with acceptable maturity and tuber characteristics were ND6588B-13 (J101K27 x ND5433-2), ND6590B-3 (J101K27 x S440), ND6595B-22 and -42 (J138A12 x Norchip), AND9552-4 (AWN86514-4 x AO84275-3), AND9504-1 (J101K6 x A84118-3), BO718-3, and Robijn.

Twenty-nine entries were also evaluated in a replicated trial, the results of which are presented in Figure 1. As in the 5 hill, unreplicated plots, the entries in the replicated trial displayed a range of resistance / susceptibility. Most notably resistant were three clones from the family AND9524 (J138A4 x A84118-3), as well as AND9504-1 (J101K6 x A84118-3), AND9517-2 (J103K7 x A84118-3), BND1849-2 (J138A12 x B1419-6), and Stirling. These clones will be used as parents in the 1999 crossing program.

The breeding program is also incorporating genetic resistance to *Verticillium* wilt, early blight, silver scurf, PLRV, PVY, green peach aphid and Colorado potato beetle into commercially-acceptable clones. ND5822C-7 is an example of our efforts in this area. Identified as resistant to Colorado potato beetle in screenings by Drs. Lorenzen and Balbyshev and in the 1998 Park River screening trial, ND5822C-7 is also notable for its yield and tuber-type in the 1998 yield trials.

In addition, the following report updating their efforts in germplasm enhancement was contributed by Jim Lorenzen, Nikolay Balbyshev, Abbas Lafta, Boris Sagredo, and Wayne Larson:

Field 1998: Eight trials were planted to screen for resistance to the Colorado potato beetle in Crookston, Fargo, and McLeod. In each trial, lines were selected that were nearly untouched by the beetles. One of the main resistance factors in many of these lines is the glycoalkaloid, leptine. Laboratory tests showed that new populations developed for this factor had nearly twice the percentage leptine as previous generations, with nearly 80% of the foliar glycoalkaloid content as this potent beetle deterrent. The screening site at McLeod also proved to be an excellent site for screening for scab resistance. Scab severity was scored for two tetraploid populations for which genetic maps are being developed. This will allow us to identify the location of the gene(s) that cause scab resistance. This mapping effort has identified a gene locus that is responsible for much of the variation in leptine content, and an additional locus that further amplifies beetle resistance. There was wide variation in yields in this mapping population, with about 20% of the clones having higher yields than the average of the three higher yielding check clones, Red Pontiac, Russet Burbank, and Shepody. The maximum individual plot yield of a beetle-resistant test line was 660 cwt/acre, more than double that of the check varieties in that trial.

Greenhouse : Crosses were made to combine beetle resistance with late blight resistance from two tetraploid sources. In addition, three diploid populations were scored for resistance to *Verticillium*. Two of these populations also segregated for a high degree of resistance to late blight (US-8), and were screened for late blight resistance. Chip quality from cold storage will be determined in the near future. DNA fingerprinting methods are being utilized to identify gene loci that determine resistance to *Verticillium*, late blight, and cold-sweetening.

North Dakota Table 1. Spacing, fertilizer, soil type, planting and harvest dates of the 1998 North Dakota Potato Variety Trial Sites.

Location	Spacing		Plant	Fertilizer Applied	Soil Types	Planting Date	Rotobeat
	Row						
Crookston	38"		12"	120 lbs soil N, 60 lbs/A of P ₂ O ₅ , 40 lbs/A of K ₂ O	Wheatville prairie fine sandy loam	5-22	9-8
McCanna	38"		12"	150 lbs/A of P ₂ O ₅ , 60 lbs/A of K ₂ O, copper sulfate @ 3/4 pint/A, Sidedress of 28-0-0 @ 15 gal/A, fertigation of 28-0-0 6 times during season.	Sandy loam	4-21	9-9
McLeod	38"		12"	160 lbs/A of N (Total with soil nitrogen= 166 lbs/A), 60 lbs/A of P ₂ O ₅ , 100 lbs/A of K ₂ O	Hecla fine sandy loam	5-7	9-3
Park River	38"		12"	Soil test indicated 231 lbs/A of N, and sufficient P and K	Glyndon silt loam	4-21	8-6

Note: The North Dakota advanced selections described in these trials can be distinguished as russet, red, or white-skinned by:

ND5555-5 = white
 ND5555-5R = red
 ND5555-5Russ = russet

North Dakota Table 2. Performance of potato cultivars and advanced selections under irrigated conditions at McCanna, ND--1998.

Variety/Selection	Yield (cwt/acre)		% U.S. No. 1	Tuber Categories as % of Total Yield					Specific Gravity	% Internal Defects ^b			Tuber Number per Hill
	U.S.# 1 ^a	Total		Cullage	Undersize (<2")			HH/BC		VD	IBS		
					2 - 2.5 "	2.5-3.5"	>3.5"						
Red Pontiac	468 a	513	92	5	3	12	43	37	1.064	0	6	0	8
ND5822C-7	468 a	499	93	3	4	22	66	6	1.087	21	0	2	12
ND5775-3	393 ab	453	87	2	11	52	35	0	1.081	6	8	0	11
ND5084-3R	376 abc	415	90	5	5	14	48	28	1.061	0	2	0	12
ND2676-10	371 abc	394	94	0	6	28	63	4	1.074	40	4	0	12
NorValley	358 bcd	402	89	4	7	24	52	13	1.076	2	2	2	12
Shepody	353 bcde	514	69	28	3	13	28	27	1.085	4	6	0	9
Russet Norkotah	330 bcdef	354	93	2	5	35	47	11	1.073	0	6	0	7
A79180-10	328 bcdef	358	91	4	5	24	56	11	1.087	8	0	0	7
ND5002-3R	324 bcdefg	346	93	1	5	24	58	12	1.069	0	2	0	12
ND2470-27	306 bcdefgh	335	90	5	5	23	57	11	1.078	0	6	0	15
Snowden	305 bcdefgh	332	92	3	5	28	55	10	1.087	0	10	0	6
Norchip	299 bcdefgh	342	87	4	9	45	41	1	1.077	0	6	2	12
Goldrush	287 bcdefghi	350	81	14	5	21	45	16	1.074	0	4	0	12
ND3574-5R	286 bcdefghi	311	92	3	5	19	62	10	1.059	0	2	0	13
Atlantic	285 bcdefghi	337	84	12	4	19	52	14	1.086	4	0	6	14
Russet Burbank	262 cdefghi	376	71	23	6	33	31	7	1.082	19	0	8	6
ND4093-4Russ	253 defghi	279	91	3	7	38	47	6	1.068	0	0	2	9
ND4778-2	252 defghi	279	90	2	7	31	54	5	1.077	2	6	0	9
Red Norland	249 defghi	276	90	6	4	24	60	6	1.061	0	6	0	8
Dark Red Norland	240 efghi	256	94	1	6	34	56	3	1.065	0	6	0	10
NorDonna	224 fghi	246	91	2	7	26	54	11	1.063	0	13	0	11
ND3196-1R	211 ghi	251	83	5	12	37	46	0	1.069	2	0	0	9
ND2225-1R	206 hi	235	87	2	11	36	50	1	1.060	0	4	2	10
ND4027-4Russ	176 i	213	81	2	17	41	40	0	1.079	8	4	0	8

^a Yield means with the same letter are not considered significantly different from one another based on Duncan's Multiple Range Test with an alpha value of 0.05.^b Internal Defects abbreviations: HH/BC = Hollow Heart or Brown Center, VD = Vascular Discoloration, and IBS = Internal Brown Spot.

Values represent the percentage of 48 tubers (2.5-3.5" in size) that had the internal defect.

North Dakota Table 3. Performance of potato cultivars and advanced selections under irrigated conditions at McLeod, ND --1998.

Variety/Selection	Yield (cwt/acre)		% U.S. No. 1	Tuber Categories as % of Total Yield					Specific Gravity	% Internal Defects ^b			Maturity ^c
	U.S.# 1 ^a	Total		Cullage	Undersize (<2")	2 - 2.5 "	2.5"-3.5"	>3.5"		HH/BC	VD	IBS	
ND5084-3R	374 a	405	92	2	6	17	62	14	1.061	0	13	0	4.0
ND5822C-7	339 ab	388	87	3	9	33	45	9	1.086	8	2	13	5.0
Atlantic	333 abc	371	90	3	8	31	43	15	1.087	19	17	4	3.5
ND5775-3	320 abcd	390	82	1	17	55	27	0	1.089	2	4	0	3.5
Russet Norkotah	320 abcd	373	86	4	10	35	45	6	1.074	2	4	2	2.5
Red Pontiac	295 bcde	327	90	3	8	30	49	11	1.062	2	2	2	3.5
ND5002-3R	274 bcdef	306	89	1	10	30	55	4	1.069	0	0	0	4.0
NorValley	272 bcdef	320	85	4	11	26	47	11	1.076	0	0	0	3.5
Snowden	267 bcdef	303	88	2	10	37	39	12	1.087	0	4	0	4.0
Norchip	266 bcdef	324	82	3	14	38	44	1	1.081	0	4	4	3.5
ND2676-10	257 bcdefg	309	83	2	15	46	34	3	1.080	29	2	10	3.0
ND4778-2	256 cdefg	286	89	1	10	39	41	10	1.082	2	2	2	3.0
ND3196-1R	249 defg	299	83	6	10	37	45	1	1.075	4	2	0	2.0
I426	241 defgh	272	89	2	9	35	51	2	1.078	0	17	6	3.0
A79180-10	230 efgh	264	85	2	13	25	59	1	1.089	8	4	0	4.5
ND2225-1R	229 efgh	271	85	2	14	37	42	6	1.066	0	2	4	2.5
Goldrush	228 efgh	291	78	6	16	50	25	3	1.070	10	2	0	3.5
ND4027-4Russ	226 efgh	265	85	2	13	46	36	3	1.084	6	0	0	3.5
NorDonna	224 efgh	256	87	2	11	41	43	3	1.069	0	25	0	4.0
Shepody	223 efgh	298	76	17	7	39	36	1	1.077	19	6	0	3.5
ND2470-27	208 fgh	219	95	1	4	23	54	18	1.074	2	6	0	3.5
ND4093-4Russ	206 fgh	233	88	5	6	24	59	5	1.071	27	2	2	2.5
ND3574-5R	177 gh	212	83	5	12	36	46	2	1.062	2	6	0	2.0
Russet Burbank	160 h	266	60	23	17	43	17	0	1.072	29	2	0	5.0
Dark Red Norland	159 h	197	81	2	17	41	31	9	1.061	2	2	0	2.0
N8-14	159h	236	65	3	32	39	22	4	1.075	0	4	0	2.5

^a Yield means with the same letter are not considered significantly different from one another based on Duncan's Multiple Range Test with an alpha value of 0.05.

^b Internal Defects abbreviations: HH/BC = Hollow Heart or Brown Center VD = Vascular Discoloration, and IBS = Internal Brown Spot.

Internal Defect % Values represent the percentage of 48 tubers (2.5-3.5" in size) that had the internal defect.

^c Range of maturity is 1=very early to 5=late.

North Dakota Table 4. Performance of potato cultivars and advanced selections in the out-of-state trial under irrigation at McLeod, ND--1998.

Variety/Selection	Yield (cwt/acre)		% U.S. No. 1	Tuber Categories as % of Total Yield					Specific Gravity	% Internal Defects ^b			Maturity ^c
	U.S.# 1 ^a	Total		Cullage	Undersize (<2")	2 - 2.5 "	2.5"-3.5"	>3.5"		HH/BC	VD	IBS	
Norchip	342 a	397	86	3	11	31	54	1	1.076	4	8	2	3.0
Morning Gold	341 a	396	86	7	7	26	56	4	1.076	4	8	4	4.0
Latona	328 a	422	77	8	15	54	23	0	1.077	0	10	0	4.5
Red Pontiac	316 ab	347	91	5	5	18	55	18	1.058	4	15	0	4.5
Picasso	310 abc	413	76	14	10	34	38	4	1.060	0	8	0	4.5
NorValley	281 abcd	347	81	11	8	26	54	1	1.073	2	4	0	3.0
Russet Norkotah	267 abcd	295	91	0	9	48	39	4	1.074	4	6	0	4.0
Romina	251 abcd	325	77	4	19	43	35	0	1.073	0	4	6	4.5
Amadeus	222 abcd	289	77	6	17	38	36	3	1.070	0	73	0	4.5
Victoria	213 cde	370	58	12	30	48	10	0	1.070	2	17	8	4.5
Fianna	208 cdef	273	76	6	18	49	27	0	1.071	0	15	8	4.5
Caesar	205 def	257	80	6	13	55	22	3	1.080	0	0	0	4.0
Shepody	198 def	227	87	6	7	30	44	12	1.075	4	19	0	4.0
Dark Red Norland	134 efg	188	72	7	21	45	25	2	1.060	0	6	2	3.0
ND04592-3R	133 efg	194	69	6	25	47	22	0	1.069	8	14	3	4.0
TXNS278	133 efg	154	87	4	9	35	33	19	1.071	17	13	2	3.0
Innovator	121 efg	183	64	24	13	46	14	4	1.069	0	0	4	4.0
Symfonia	105 fg	173	58	14	27	45	14	0	1.066	4	38	4	5.0
Russet Burbank	88 g	206	40	31	29	33	7	0	1.061	4	0	0	5.0
Dali	87 g	209	42	28	30	27	14	0	1.067	2	2	0	5.0

^a Yield means with the same letter are not considered significantly different from one another based on Duncan's Multiple Range Test with an alpha value of 0.05.

^b Internal Defects abbreviations: HH/BC = Hollow Heart or Brown Center VD = Vascular Discoloration, and IBS = Internal Brown Spot.

Values represent the percentage of 48 tubers (2.5-3.5" in size) that had the internal defect.

^c Range of maturity is 1=very early to 5=late.

North Dakota Table 5. Performance of potato cultivars and advanced selections under non-irrigated conditions at Crookston, MN--1998.

Variety/Selection	Yield (cwt/acre)		% U.S. No. 1	Tuber Categories as % of Total Yield				Specific Gravity	% Internal Defects ^b		Maturity ^c	Tuber No. per Hill
	U.S.# 1 ^a	Total		Cullage	Undersize (<2")	2 - 2.5 "	2.5"-3.5" >3.5"		HH/BC	VD		
Russet Norkotah	316 a	350	90	3	7	34	44	12	1.090	4	0	5
Norchip	316 a	353	90	4	7	38	50	1	1.098	0	8	8
ND2676-10	286 ab	307	93	0	7	31	63	0	1.103	0	3	11
ND3574-5R	257 abc	277	92	2	5	30	58	5	1.086	0	4	6
ND5084-3R	254 abcd	278	91	3	6	21	63	7	1.076	0	0	7
Red Pontiac	241 abcde	290	83	12	5	18	46	18	1.078	0	0	4
ND4093-4Russ	233 bcdef	277	84	3	13	52	32	0	1.087	25	0	12
NorValley	229 bcdef	258	89	5	6	27	48	14	1.088	2	2	6
ND2470-27	226 bcdef	252	89	3	8	27	57	5	1.092	0	0	8
ND5822C-7	225 bcdef	245	92	0	8	46	44	2	1.094	2	8	6
ND5775-3	223 bcdef	247	91	2	7	54	36	0	1.097	0	2	10
Amadeus	221 bcdef	250	88	2	9	29	58	1	1.093	0	0	4
Atlantic	219 bcdef	237	92	3	5	26	63	3	1.100	2	17	7
ND4778-2	218 bcdef	243	90	6	4	20	64	6	1.085	8	2	15
Goldrush	207 bcdef	246	84	10	6	30	45	8	1.083	6	0	7
ND5002-3R	205 cdef	232	88	1	11	42	46	0	1.080	0	4	9
Dark Red Norland	193 cdef	212	91	3	6	46	45	0	1.073	0	2	6
ND4027-4Russ	188 cdef	225	84	4	12	52	30	1	1.096	17	0	10
ND2225-1R	182 cdefg	204	89	4	8	32	54	3	1.079	0	2	10
Snowden	174 defg	195	89	4	6	44	41	4	1.102	0	0	9
ND3196-1R	174 defg	204	83	9	8	34	48	2	1.088	4	0	5
A79180-10	167 efg	190	88	7	5	29	53	6	1.088	25	0	8
N8-14	160 efg	189	84	3	13	45	39	0	1.089	0	0	11
Shepody	160 efg	221	72	20	7	29	36	7	1.080	2	0	7
I426	152 fg	190	79	6	15	38	41	0	1.085	0	13	7
NorDonna	107 gh	134	79	6	15	41	38	0	1.077	0	0	5
Russet Burbank	69 h	137	48	37	15	36	13	0	1.088	2	0	6

^a Yield means with the same letter are not considered significantly different from one another based on Duncan's Multiple Range Test with an alpha value of 0.05.

^b Internal Defects abbreviations: HH/BC = Hollow Heart or Brown Center, VD = Vascular Discoloration, and IBS = Internal Brown Spot.

Values represent the percentage of 48 tubers (2.5-3.5" in size) that had the internal defect.

^c Range of maturity is 1=very early to 5=late.

North Dakota Table 6. Colorado potato beetle feeding trial, Park River, ND--1998.

Variety/Selection	Total Yield ^a (Cwt/A)	% Defoliation ^a
NorValley	166 a	30 bc
ND5822C-7	160 ab	9 a
Red Pontiac	154 abc	42 bcde
ND5002-3R	137 abcd	30 bc
Goldrush	135 abcde	37 bcd
Norchip	121 bcdef	67 gh
Shepody	117 cdefg	27 b
Atlantic	117 cdefg	57 efg
ND2676-10	115 cdefg	62 fgh
Snowden	114 cdefg	52 defg
ND5084-3R	113 cdefg	30 bc
A79180-10	103 defgh	47 cdef
ND2470-27	101 defgh	67 gh
Russet Burbank	100 defgh	52 defg
ND3196-1R	100 defgh	80 hi
ND5775-3	95 defgh	77 hi
Russet Norkotah	95 defgh	52 defg
ND2225-1R	94 defgh	47 cdef
Red Norland	92 efgh	70 gh
Dark Red Norland	82 fgh	65 fgh
ND4093-4Russ	78 fgh	70 gh
ND4778-2	78 fgh	87 ij
ND4027-4Russ	74 gh	32 bc
NorDonna	64 h	70 gh
ND3574-5R	61 h	100 j
Average:	107	55

^a Yield and defoliation means with the same letter are not considered significantly different from one another based on Duncan's Multiple Range Test with an alpha value of 0.05.

North Dakota Table 7. Summary of U.S. No. 1 yields (cwt/A) in primary trials at all sites.

Clone	Irrigated Sites			Non-Irrigated	Average Yield Across All Entered Sites
	McCanna	McLeod	Average	Crookston	
Whites					
N8-14	not an entry	159	159	160	160
ND2470-27	306	208	257	226	247
ND2676-10	371	257	314	286	305
ND4778-2	252	256	254	218	242
ND5775-3	393	320	357	223	312
ND5822C-7	468	339	404	225	344
Atlantic	285	333	309	219	279
Norchip	299	266	283	316	294
NorValley	358	272	315	229	286
Snowden	305	267	286	174	249
Average Yield of White Entries	337	268	294	228	278
Reds					
I426	not an entry	242	242	152	212
ND2225-1R	206	229	218	182	206
ND3196-1R	211	249	230	174	211
ND3574-5R	286	177	232	257	240
ND5002-3R	324	274	299	205	268
ND5084-3R	376	374	375	254	335
Amadeus	not an entry	not an entry	0	221	221
Dark Red Norland	240	159	200	193	197
NorDonna	224	224	224	107	185
Red Norland	249	not an entry	249	not an entry	249
Red Pontiac	468	295	382	241	335
Average Yield of Red Entries	287	247	265	199	244
Russets / Long Whites					
A79180-10	328	231	280	167	242
ND4027-4Russ	176	226	201	188	197
ND4093-4Russ	253	206	230	233	231
Goldrush	287	228	258	207	241
Russet Burbank	262	160	211	69	164
Russet Norkotah	330	320	325	316	322
Shepody	353	223	288	160	245
Ave. Yield of Russ / Long Whites	284	228	256	191	234
Average U.S. No.1 Yield At Sites:	303	247	271	206	252

North Dakota Table 8: Average french fry evaluation scores for the 1997 season.

Cultivar or Selection	Color ¹	Texture ¹	Flavor ¹	Combined Sensory Score ²
McCanna Site				
Simplot Russet Burbank	7.6	6.7	6.7	7.0
ND4027-4Russ	6.9	6.8	6.8	6.8
Agria	6.6	6.5	6.6	6.6
Russet Burbank	6.5	6.6	6.6	6.6
NDL128-11	6.7	6.1	6.6	6.5
ND4093-4Russ	7.2	6.1	6.1	6.5
Romano	6.9	6.2	6	6.4
Sante	6.1	6.2	6.7	6.3
Fianna	6.3	5.9	6.4	6.2
Lili	6.7	5.8	5.9	6.1
A79180-10	6.2	6.2	5.7	6.0
Russet Burbank	6.3	5.9	5.6	5.9
A82119-3	6.3	5.8	5.6	5.9
SW88-109	6.5	5.1	6	5.9
Shepody	6.5	5.5	5.2	5.7
Ore Ida	5.1	6	6.1	5.7
Russet Norkotah	6.1	5.4	5.5	5.7
ND5104-1Russ	5.9	4.8	5.5	5.4
ND5104-2Russ	6	4.9	4.8	5.2
Goldrush	4.7	5.3	5.3	5.1
Picasso	5	4.8	5.1	5.0
Texas European Trial at Grand Forks Site				
ATX9201-1Russ	7.3	7	6.7	7.0
ND5343-1Russ	6.6	6.8	6.9	6.8
COO83008-1	6.7	6.6	6.6	6.6
Fianna	6.8	6.5	6.4	6.6
ND4219-14Russ	6.6	6.5	5.8	6.3
SW91102	7.1	6.3	5.3	6.2
Shepody	6.5	6.2	6	6.2
ND4233-1Russ	6.4	5.8	6.2	6.1
NDO2904-7Russ	6.5	5.8	5.8	6.0
ATX9202-3Russ	6.3	6.3	5.3	6.0
Asterix	5.8	6.2	5.8	5.9
ND4240-9Russ	5.6	5.8	6.1	5.8
TXAU657-27Russ	6.2	5.7	5.6	5.8
Russet Burbank	5.7	6	5.7	5.8
Goldrush	5.9	5.4	6.1	5.8
TXNS223	4.9	6.2	6.1	5.7
TXNS112	5.7	5.5	5.4	5.5
Dali	5.3	5.4	5.4	5.4
Viking	5.4	5.1	5.6	5.4
Russet Norkotah	5	5.2	5.9	5.4
ND2667-9Russ	4.5	5.3	5.6	5.1
ATX9220-3Russ	4.5	5.2	5.7	5.1
Rikea	4.8	5	5.3	5.0
TXNS278	4.7	5.1	4.9	4.9
ATX9204-2Russ	4.2	4.4	5.2	4.6
ATX87262-2Russ	3.8	5.2	4.6	4.5

¹Rating Guide

7-9	Good
5-6	Fair, and acceptable
1-4	Poor, not acceptable

² Combined Sensory Score is the average of the three ratings for color, texture, and taste.

North Dakota Table 9: Chipping evaluation of cultivars and selections grown at three North Dakota 1997 state trial sites [McCanna(M), Grand Forks (GF) and Park River (PR)].

Variety or Selection	First Chipping: Direct Chip from 43 ^{o1}	Second Chipping: Two Weeks Reconditioning ²	Third Chipping: Four Weeks Reconditioning ³
Agtron Reading⁴			
Atlantic	43	48	50
Goldrush	37	40	41
Norchip(M,GF o	47	52	55
NorValley	55	52	58
Russet Burbank	36	37	41
Russet Norkotah	34	42	45
Shepody	38	43	48
Snowden	51	52	55
A79180-10	40	45	48
A82119-3	35	41	43
N8-14	58	57	59
NDL128-11(GF,	34	41	46
NDO1496-1	53	55	56
ND860-2	52	56	56
ND2470-27	53	55	56
ND2676-10	56	59	58
ND3636-1	52	56	56
ND3647-6	53	54	56
ND3828-15	56	58	59
ND4027-4Russ	39	42	45
ND4093-4Russ	41	44	48
ND4778-2	52	53	55
ND5104-1Russ(	36	38	38
Fianna(GF,PR o	46	51	54
Single site entries grown in trials at McCanna(M), Grand Forks(GF), Oakes (O) or Park River (PR) ND.			
Lili(M)	45	41	50
Picasso(M)	24	30	32
Pike(GF)	45	54	56
Romano(M)	43	55	53
SW88109(M)	40	42	45
ND2676-12(GF)	53	58	57
ND5104-2Russ(	44	45	49
ND5775-3(GF)	54	55	55
ND5822C-7(GF)	48	53	57
Agria(O)	50	54	51
Dali(GF)	37	39	43
Rikea(GF)	34	32	37
Sante(O)	39	57	54
SW91102(GF)	50	47	55

¹Stored for 4 weeks at 43^{oF}

²Stored for 4 weeks at 43^{oF}, Reconditioned for 2 weeks at 65^{oF}

³Stored for 4 weeks at 43^{oF}, Reconditioned for 4 weeks at 65^{oF}

⁴Agtron 0-90

0=Black; 90=white

55=minimum acceptable color

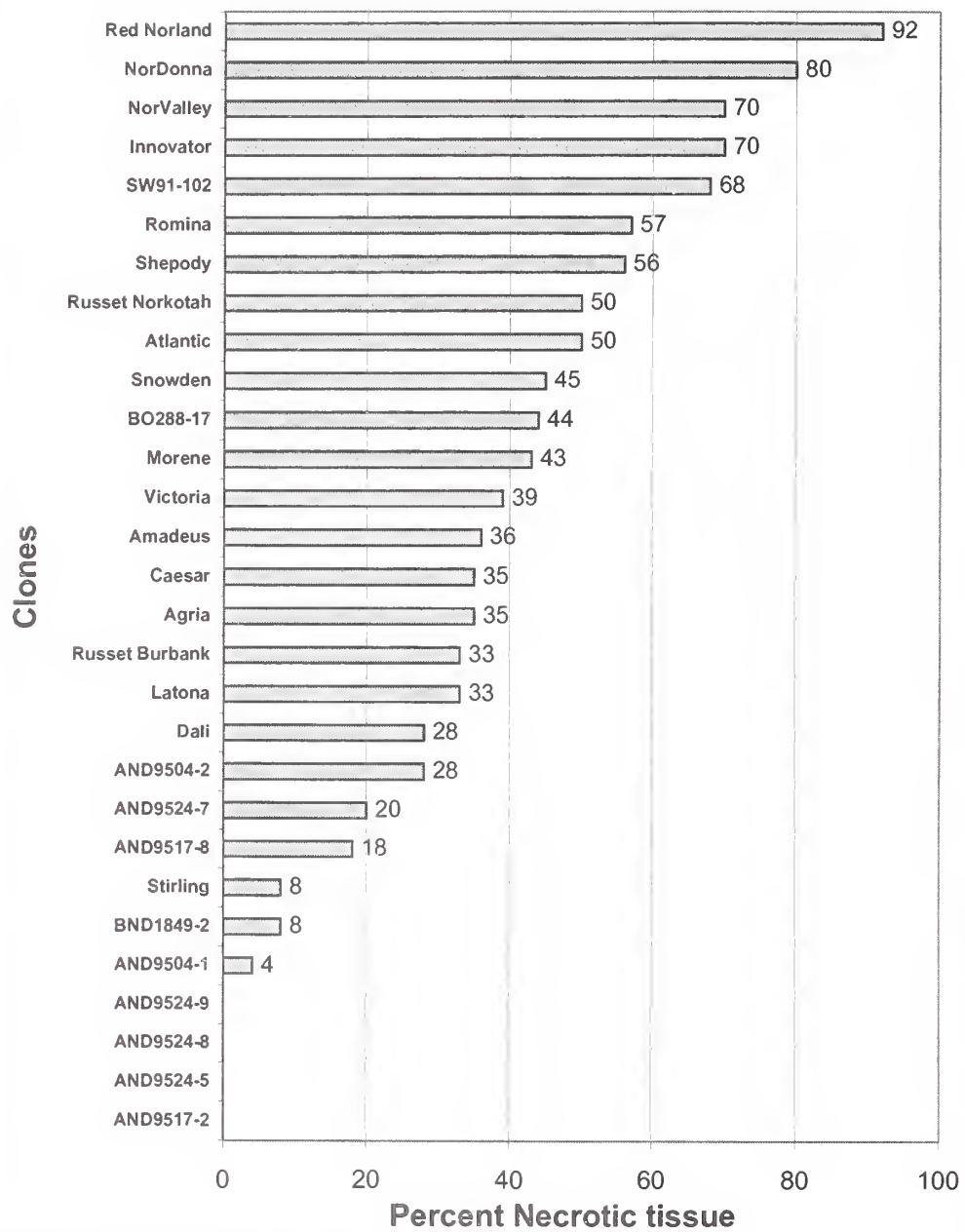


Figure 1. Resistance/susceptibility of potato clones to late blight at Prosper, ND--1998.

OHIO

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OHIO OBSERVATION TRIALS

Introduction

One hundred twenty-two entries from various parts of the country were evaluated in a non-replicated field trial located at the Ohio Agricultural Research and Development Center, Wooster, Ohio.

Methods

When received, the seed samples were stored under recommended temperatures and humidity conditions. The observation experiment was set up as a completely randomized design with a single planting of each entry. Soil type was a well-drained Wooster silt loam with a pH 6.0 and phosphorus level of 102 lb/A and potassium level of 186 lb/A according to the analytical procedures of the Research and Extension Analytical Laboratory at the Ohio Agricultural Research and Development Center. Fertilization consisted of 600 lb/A of 10-20-20 disked in prior to planting and 600 lbs/A 10-20-20 banded at planting.

Following harvest on September 23-24, samples were taken for chip and cooking quality evaluation only on those entries that we felt might have potential in Ohio. These were taken to the Pilot Plant at The Ohio State University, Columbus, Ohio. The samples were held in a refrigerated storage at 55°F, and then removed and held for 7 days at ambient temperatures for chipping (approx. 70°F). Following specific gravity determination, a sample was placed in an abrasive peeler and then sliced to an approximate thickness of 0.063 inches (approximately 16 slices per inch).

Results

The promising cultivars on the basis of 1998 observation at harvest are included in Ohio Tables 1-3. Other cultivars which may be suitable for other environmental situations are listed in Ohio Table 4. Maturity rating based on the NE184 plant maturity rating scale, with 1=very early and 9=very late.

1998 Observations and Comments on Breeding Lines

- W94-4172-1 - Round to slightly oval tubers, pink appearance with irregular surface and knobby. NO.
- AF1611-6 - Round tubers with white surface, but with much surface scab. Appears to have sizing ability. NO.
- AF1938-2 - Round to slightly oval tubers with buff appearance and fairly smooth surface. Appears to have sizing ability. YES.
- AF1455-20 - Round to oval tubers with buff surface. Surface scab could be problem. Apical end tends to be deep. NO.
- AF1773-1 - Round to slightly oval tubers with buff surface, coarse netting. Surface scab. Poor appearance. NO.
- AF1921-9 - Round to slightly oval tubers with buff appearance. Trace of irregular surface. Surface scab is present. NO.
- AF1896-5 - Round to slightly oval tubers with irregular surface and poor appearance. Misshapened. NO.
- AF1908-4 - Round to slightly oval tubers with buff appearance. On larger tubers, deep apical end is problem. Growth cracks. NO.
- AF 1606-8 - Round to oval shaped tubers with buff appearance. Larger tubers have an irregular surface. Surface scab is present. NO.
- AF 1775-2 - Round to slightly oval tubers with buff appearance. Medium to large tubers have irregular surface. Trace of second growth. NO.
- AF1753-1 - Round to oval tubers with buff appearance. Irregular surface, misshapened and knobby appearance. NO.
- AF1938-3 - Round to oval tubers with buff appearance. Surface scab and lenticels infected. Lenticels are a problem. NO.
- B1761-2 - Round tubers, with red appearance. Slightly oval to oblong. Major problem is "scurfy type" surface. NO.

- | | | | |
|----------|--|----------|---|
| B1521-2 | - Round tubers, medium dark red color, surface scab and small tubers. NO. | | surface, some tubers are "flattish". Wide range in size. NO. |
| B1763-5 | - Round to slightly oval tubers with pink-light red color-poor for market (color). NO. | B1752-5 | - Round to slightly oval tubers with bright tan surface, shallow eyes, shallow apical end, shallow stem end. Fairly uniform size. Yellow flesh. Try again. YES. |
| B1739-3 | - Oval to oblong to long tuber shape, light cream appearance. Many tubers have an irregular surface. Poor appearance (variation in shape and surface). NO. | B1758-2 | - Round to oval tubers, purple surface. Wide range in size. NO. |
| B1763-2 | - Round tubers with light red appearance. Color is too light for fresh market. NO. | B1753-1 | - Round to oval to oblong tubers shapes with light cream--buff appearance. Major problems: misshapened, surface scab, and wide range in size. NO. |
| B1524-2 | - Round tubers with medium red appearance and "scurfy" surface. Stolons are attached. NO. | B1756-1 | - Round to mostly oval tubers, purple surface, fairly smooth tubers, tubers tend to be pointed (stem end). NO. |
| B1522-1 | - Medium red tubers with "checkered" surface and surface scab. NO. | B1749-15 | - Round to oval tubers with tan surface, apical end is indented. Trace of second growth. NO. |
| B1526-1 | - Round tubers, red. Major defects: surface scab, irregular surface, and poor appearance. NO. | B1749-10 | - Oval shaped tubers with light tan surface and moderate netting. Major problems: growth cracks, misshapened, and stolons are attached. NO. |
| B1749-1 | - Round to slightly oval tubers with buff appearance. Large tubers tend to be oblong. Larger tubers tend to have deep eyes. NO. | B1709-5 | - Oval to oblong tubers with buff surface. Larger tubers have irregular surface and stolons are attached. NO. |
| B1710-8 | - Round tubers with light buff appearance. Shallow eyes, shallow stem end, smooth surface. May need more space, and irrigation. YES. | B1709-4 | - Round to oval tubers with buff surface, light netted surface. Apical end is indented. Major problems: irregular surface, surface scab. NO. |
| B1529-1 | - Round to oval tubers--cracks--dark purple NO. | B1703-3 | - Round to oval tuber shape with light buff appearance, knobiness and surface scab. NO. |
| B1739-1 | - Oval to oblong tubers with medium to heavy russetting and (most tubers) irregular surface. Long tubers tend to be curved. Other defects: misshapened and knobby. NO. | B1522-6 | - Round tubers with "scurfy" surface, medium red surface, surface scab is serious. NO. |
| B1758-14 | - Round tubers with dark red surface, some tubers have irregular surface. Apical end tends to be slightly indented. YES. | BO811-4 | - Round tubers with light red surface, many small tubers, irregular surface. NO. |
| B1749-5 | - Round to oval tubers with light tan surface, growth cracks, surface scab and irregular surface. NO. | B1711-16 | - Round to oval shaped tubers, with medium buff appearance. Problems: irregular surface and surface scab. NO. |
| B1761-10 | - Round to mostly oval tubers with pink surface, netted red-pink surface. Misshapened and irregular surface. NO. | LA21-195 | - Round to oval tubers with tan surface and "scurfy" type surface. Defects: irregular surface, surface scab, and attached stolons NO. |
| B1523-4 | - Round to slightly oval tubers with light red surface. Stolons are attached. NO. | LA01-221 | - Round to slightly oval tubers with buff surface. Problems: irregular surface and surface scab. NO. |
| B1758-3 | - Round to oval tubers with light red | | |

- LA22-218 - Round tubers with medium red surface. Major defects: surface scab, growth cracks, and serious irregular surface. NO.
- LA12-114 - Round to oval-shaped tubers with light red surface, "scurfy" texture. No uniform shape, misshapened. NO.
- LA22-187 - Round to slightly oval tubers with light red surface. Irregular surface. NO.
- LA22-84 - Round to slightly oval tubers with medium red surface. Wide range in size. Irregular surface. NO.
- LA12-115 - Round to slightly oval tubers with buff surface. Major problems: irregular surface, second growth, and poor appearance. NO.
- LA23-02 - Round to oval tubers with dark purple surface. Feathering. Field sprouting. NO.
- LA22-143 - Round to mostly oval shaped tubers with severe growth cracks, "scurfy" surface and poor appearance. NO.
- LA11-36 - Round to mostly oval tubers with buff surface and light netting. Larger tubers are curved and some are pointed. Feathering. NO.
- LA01-222 - Round tubers with light buff appearance, wide range in size. NO.
- LA72-12 - Round to slightly oval tubers with pink surface. Many tubers have irregular surface. NO.
- LA12-88 - Round tubers with medium red surface, shallow eyes, good shape, shallow apical end. YES.
- LA93-84 - Round to oval tubers with light purple surface, severely misshapened. NO.
- LA12-86 - Round to oval shaped tubers with light red surface. Misshapened. Many tubers with irregular surface. NO.
- LA01-212 - Round to oval tubers with buff surface, deep apical end, deep eyes, irregular surface. NO.
- LA21-145 - Round to oval tubers with buff surface. Major defects: irregular surface and surface scab. NO.
- NYS 32-2 - Round to oval tubers with light buff surface. Major problem: enlarged lenticels and irregular surface. NO.
- NYS27-2 - Round to oval tubers to slightly oval with tan surface, medium netting, tubers tend to be slightly flattish. Wide range in size. Apical end tends to be "folded". No future in Ohio. NO.
- NYS4-2 - Round to oval tubers with tendency for tubers to be "flattish". Some tubers have moderate netting. Major defects: second growth, surface scab, no uniform size. NO.
- NYS31-7 - Round to slightly oval tubers with light tan surface, shallow eyes. Uniform shape, uniform size. Trace of netting and trace of surface scab. YES.
- NYS 34-3 - Round to slightly oval tubers with buff surface, some netting, shallow eyes, uniform size and shape. YES.
- NYS 4-3 - Round to slightly oval tubers with light cream surface. Wide range in size. Irregular surface. Poor appearance. NO.
- NYS-300-1 - Round to slightly oval tubers with light cream surface. Wide range in size. Irregular surface. Poor appearance. NO.
- NYS 300-13- - Round to oval tubers with buff surface. Larger tubers tend to be "knobby". Irregular surface. NO.
- NYS 300-9 - Round to slightly oval tubers with buff appearance. Major defects: deep apical end, surface scab, stolons attached and infected lenticels. NO.
- NYS 3-1 - Round to oval tubers with medium buff surface and light netting. Major problems: irregular surface, surface scab, and infected lenticels. NO.
- NYS 31-1 - Round to oval tubers with buff surface. Surface scab and irregular surface are defects. NO.
- NYS 26-2 - Round to slightly oval tubers with tan surface. Major problems: wide range in size, surface scab and stolons remain attached. NO.
- NYS 28-2 - Round to mostly oval tubers. Major problems: irregular surface, deep apical end, stolons are attached. NO.
- NYS 106-17- - Round to slightly oval tubers with buff surface. Problems: deep apical end and wide range in size. NO.

NYS 31-3	-	Oval tubers with buff surface. Major defects: feathering, surface scab, irregular surface, and infected lenticels. NO.			surface and with coarse netting. Small tubers have irregular surface. Stolons are attached. NO.
NYS 33-5	-	Round to oval tubers with buff surface and light netting. Larger tubers have irregular surface. Apical end is indented. Wide range in size. NO.	PANDA	-	Round to slightly oval with light "creamy" appearance and with coarse netting. Many small potatoes. Small potatoes have irregular surface. NO.
NYS 14-2	-	Round to slightly oval tubers with buff surface. Poor appearance. Major effects: misshapened, surface scab, deep apical end, and infected lenticels. NO.	SANTINA	-	Small tubers are round, larger tubers tend to be oval, tan appearance, misshapened, irregular surface. Light netting. NO.
NYS 300-7	-	Round to oval tubers with buff surface. Apical end is deep and infected lenticels. NO.	ROSARA	-	Oval tubers, pink surface, shallow eyes. NO.
NYS 32-3	-	Round to oval tubers with buff surface. Deep apical end and irregular surface. NO.	HGATA FL-		Oval tubers with buff surface, very irregular surface, eyes are deep. Poor appearance. NO.
WISC 1368	-	Round to slightly oval tubers with tendency to be flattish. Infected lenticels and surface scab. NO.	PICASSO	-	Oval tubers with buff surface with pink blotches. Surface has coarse netting--irregular surface NO.
WISC 1386	-	Round to oval tubers with buff surface. Major problems: deep apical end, attached stolons, wide range in size, and irregular surface. NO.	PROUETNA-		Round to slightly oval tubers with light buff surface. Many small tubers. Second growth and irregular surface. NO.
WISC 1301	-	Round to oval tubers with buff appearance, some tubers have moderate netting and other tubers will have coarse netting. Some tubers have "scurfy" surface. Stolons attached. NO.	COSMOS	-	Round to oval tubers with light "creamy" surface. Irregular surface. Misshapened. Small amount of surface scab. NO.
WISC 1374	-	Round tubers with tan surface and heavy netting. Major problems: deep eyes, deep apical end, deep stem end, irregular surface and poor appearance. NO.	AF1753-12	-	Oval shaped tubers with buff appearance and medium to coarse netting. Larger tubers have irregular surface. Surface scab is present. Larger tubers have deep eyes. NO.
WISC 1431	-	Round to slightly oval tubers with tendency for some tubers to be "flattish". Light buff surface. Major defects: irregular surface and knobiness. NO.	AF1758-7	-	Round to oval to oblong tubers with buff surface. Surface scab. Second growth is major problem. Stolons are attached. NO.
UNO	-	Round to slightly oval tubers with buff surface. Major problems: second growth, surface scab, and small tubers. NO.	B1429A-3	-	Round to oval tubers with buff appearance and with light netting. No uniform shape. Wide range in size. Surface scab. NO.
PEPO	-	Oval to oblong tubers with light tan surface and with "fish-scale" surface. Second growth and misshapened. NO.	BO985-1	-	Round tubers with medium red appearance. Larger tubers have irregular surface and are misshapened. NO.
AZUR	-	Round to oval tubers with "creamy"	BO766-3	-	Round to oval shaped tubers with medium buff appearance. Irregular surface and considerable surface scab. Poor appearance. NO.
			B1493-8	-	Round tubers with light red appearance. Fairly smooth surface but with "scurfy" appearance. NO.

- B1492-12 - Round to slightly oval tubers. Light red surface. Light "scurfy" texture. NO.
- BO178-34 - Round to oval to oblong tubers with buff surface. Wide range in size. Surface scab is present. NO.
- B1491-5 - Round to slightly oval tubers with light red surface and trace of scab. NO.
- B1463-1 - Oval to slightly oblong tubers with tan appearance and moderate russetting. Smooth surface. Good tuber shape. Shallow eyes. YES.
- B1493-1 - Round tubers with light red appearance. Medium to large tubers are misshapened. NO.
- B1492-10 - Round tubers with light red appearance. Light "scurfy" skin. NO.
- BO967-11 - Round to oval tubers with light purple surface. Shallow eyes. NO.
- B1492-6 - Round tubers with medium red surface. Shallow eyes and shallow apical end. Some tubers have irregular surface. Appears to have sizing ability. Promising. YES.
- B1415-7 - Round tubers with light, medium netting. Smooth surface. For processing only. YES.
- BO984-1 - Round to oval tubers with light red surface. Larger tubers have irregular surface. Color is too light for present markets. NO.
- B1435-15 - Round tubers with buff appearance and netting which varies from light netting to very coarse netting. Deep eyes and deep apical end. Irregular surface. Stolons attached. NO.
- B1338-27 - Round to mostly oval tubers with buff appearance and irregular surface. NO.
- B1145-2 - Round to slightly oval tubers with light red surface and shallow eyes. Tubers have an irregular surface. NO.
- B1240-1 - Round tubers with buff appearance, fairly smooth surface, has medium netting with tendency to have "scurfy" texture. Appears to have sizing ability. For processing only. YES.
- B1240-14 - Round tubers with cream colored appearance and with light netting.
- Shallow eyes. Promising for processing only. YES.
- B1493-3 - Round tubers with light red surface, many tubers have irregular surface. Tendency for surface to be quite "scurfy". NO.
- B1491-20 - Round to slightly oval tubers with light red surface. Stolon end in many tubers seems to be pointed. Stolons attached. "Scurfy" texture. NO.
- B1425-9 - Round to oval tubers with cream colored surface. Many tubers have coarse netting. Stolons attached. Tendency for tubers to have irregular surface. NO.
- B1495-6 - Round to slightly oval tubers with light "scurfy" texture. Light red appearance. NO.
- BO852-7 - Round to oval tubers with medium purple surface. Medium to large tubers have irregular surface. NO.
- B1321-21 - Round to slightly oval tubers with light tan surface and light netting. Deep apical end. Most tubers have irregular surface. NO.
- B1603-11 - Round to oval to oblong tubers with medium buff appearance and with moderate netting. Major problem is wide difference in shape. NO.
- B1102-3 - Round tubers with light red surface. Tubers tend to be small to medium size. NO.
- Langlade - Round to slightly oval tubers with buff surface. Apical end tends to be deep. Eyes on large tubers tend to be indented. May need closer spacing. YES.
- CF7523-1 - Oval tubers with buff surface. Larger tubers tend to have deep eyes. No scab. Larger tubers tend to have irregular surface. No significant defects. Closer spacing may be helpful. YES.

OHIO NE-184 REGIONAL POTATO TRIALS

Introduction

Nineteen varieties and selections from the NE184 Regional project were evaluated in replicated field trials located at the Ohio Agricultural Research and Development Center, Wooster, Ohio.

Methods

When received from the NE184 project, the seed samples were stored under recommended temperature and humidity conditions. A randomized complete block design with replications was used.

The soil type is a well-drained Wooster silt loam with a pH 6.0, a phosphorus level of 102 lbs. and a potassium level of 186 lbs, according to the analytical procedures of the Research and Extension Analytical Laboratory at the Ohio Agricultural Research and Development Center.

Fertilization consisted of 600 lbs/A of 10-20-20 disced in prior to planting and 600 lbs/A 10-20-20 banded at planting.

Following harvest on September 23-24, samples were taken for chip and cooking quality evaluation only on those entries that we felt might have potential in Ohio. These were taken to the Pilot Plant at The Ohio State University, Columbus, Ohio. The samples were held in a refrigerated storage at 55°F, and then removed and held for 7 days at ambient temperatures for chipping (approx. 70°F). Following specific gravity determination, a sample was placed in an abrasive peeler and then sliced to an approximate thickness of 0.063 inches (approximately 16 slices per inch).

Weather Conditions

Rainfall during the growing season (May-September) was 15.26 inches.

Results

The results of this trial are found in Ohio Tables 5-7. This trial yielded several cultivars that showed promise and may be included in the 1999 trial: AF1615-1, Yukon Gold, AF1565-12, AF1424-7, Dark Red Norland, and NY103.

1998 NE-184 Regional Potato Project Observations and Comments

Atlantic - Round tubers with light tan appearance and some variable netting. Eyes and apical end tend to be indented. Wide range in size. Some tubers have irregular surface. No scab. Fair appearance, but

netted surface would be problem in fresh market.

- | | |
|----------|--|
| Katahdin | - Round to slightly oval tubers with medium buff appearance. Eyes tend to be moderately deep. Larger tubers have an irregular surface. Appears to have sizing ability. Wide range in size. Trace of misshapened tubers. Doubtful future. |
| Kennebec | - Light buff appearance. Small tubers tend to be round--larger tubers are oblong. Medium to larger tubers have irregular surface. Some tubers are misshapened. No future. |
| AF1437-1 | - Round to slightly oval tubers with buff appearance and slight netting. Apical end tends to be moderately deep. Stem end is indented. Tubers (large sized) tend to be flattish. Eyes tend to be moderately deep. No growth cracks but some tubers have irregular surface. Trace of misshapened tubers. No scab. |
| AF1480-5 | - Round to slightly oval tubers with light "creamy" appearance. Eyes are moderately deep. Trace of second growth. Major problem: irregular surface. Poor appearance. No future. |
| Snowden | - Round tubers with tan appearance. Medium to heavy netting. Tubers tend to be blocky. Apical and stolon ends tend to be indented. Medium size. Poor appearance for fresh market. For processing only. |
| AF1615-1 | - Round to slightly oval tubers with buff appearance. Fairly uniform size. Slight trace of irregular surface which could be a problem. No scab. No growth cracks. Possible problem—irregular surface. |
| BO564-8 | - Round to oval shaped tubers. Light tan appearance with light to medium netting. Tendency for surface to be "scurfy". Eyes are indented. Apical end tends to be indented. Poor appearance for fresh market. May be ok for processing. |

- BO811-13 - Medium to dark red tubers--round to slightly oval tuber shape. Eyes are slightly indented. Apical end tends to be indented. Irregular tuber surface. Surface tends to be "scurfy". No future for fresh market due to "scurfy" appearance.
- BO766-3 - Round to oval-shaped tubers with medium buff or light tan surface and with some netting. Wide range in tuber size. Eyes are deep. Trace of surface scab. Larger tubers have irregular surface. No future.
- BO856-4 - Oval shaped tubers with buff appearance and wide range of netting--medium to heavy. Other major problems: irregular surface and knobiness. No future. Wide range in tuber size.
- Superior - Round to oval shaped tubers with creamy appearance and with light netting. Eyes tend to be recessed, but not deep. Apical end on larger tubers tends to be deeper. Tendency for irregular surface. Poor appearance due to variability in tuber shape.
- Yukon Gold - Round to slightly oval tubers with tannish appearance and with light netting. Fairly uniform size. Apical end tends to be indented. Good appearance. Promising.
- AF1565-12 - Round to slightly oval tubers with buff appearance. Good tuber size. Trace of irregular surface. Apical end tends to be indented. Fairly smooth surface. Good appearance. Try again.
- AF1424-7 - Round to oval shaped tubers with buff appearance. Fairly smooth tuber surface, fairly shallow eyes, good appearance. Promising - try again.
- Nordonna - Fairly round tubers with medium red appearance. Smooth surface. Shallow eyes. Many small tubers. Doubtful future due to small size. May be worth trying with irrigation and more fertilizer.
- Dk Red Norland - Mostly round tubers with medium red appearance. Larger tubers are oval shaped. Shallow eyes, shallow apical end, shallow stem

end. Wide range in size. No scab. Trace of misshapened tubers. Try again.

- NY103 - Round tubers with shallow eyes, shallow apical end, surface is almost white. Excellent appearance. Try again. Promising.
- NY102 - Round to oval tubers with light buff appearance, fairly smooth surface. Major problems; surface scab, infected lenticels, indented apical end, and tendency for stem end to be slightly indented. No future due to appearance.

OHIO NORTH CENTRAL REGIONAL POTATO TRIALS

Introduction

Eighteen entries were tested against six standard varieties in the North Central Regional Potato Trials in replicated field trials located at the Ohio Agricultural Research and Development Center, Wooster, Ohio.

When received, the seed samples were stored under recommended temperature and humidity conditions. A randomized complete block design with three replications was used.

Soil type, soil fertility, and other details of the test are the same as in the NE-184 planting described above.

Results

The results of this trial can be found in the North Central Regional Report. Specific comments on individual entries are given below.

1998 North Central Regional Potato Trial Observations and Comments

- MN17922 - Round to slightly oval tubers with dark red appearance, excessive feathering (late?), many large tubers. Fairly shallow eyes. Trace of growth cracks. Wide range in size. Doubtful future.
- MN16478 - Round to slightly oval tubers with medium netting, light tannish appearance, major defects seem to be misshapeness and irregular

	surface. No future for fresh market due to poor appearance.		problems: second growth, growth cracks, knobiness, and misshapeness. Poor appearance. No future
MN16966	- Round to slightly oval to oblong tubers. Major problem is lack of uniform shape. Other defects: second growth, knobiness, pitted scab, and irregular surface. No future.	ND4093-4 RUSS	- Oval to oblong to long tubers with medium to heavy russetting, some with "blotchy" russetting. Some tubers are misshapened and larger tubers tend to be curved. Poor appearance-rough. No future.
MN17572	- Round to oval tubers with light red appearance. Shallow eyes and shallow apical end. Larger tubers tend to have an irregular surface. Color is too light for today's markets. No future.	ND2470-27	- Round to oval shaped tubers with tan appearance. Some tubers have medium netting. Wide range in size. Irregular tuber surface is problem. Stolons remain connected on many tubers. No future.
FV8957-10	- Round to oval shaped tubers with tan appearance and with light netting, some red "blotches" on surface. Wide range in tuber size from small to large. Larger tubers have an irregular surface. No future.	ND5084-3R	- Round to oval tubers with medium red appearance, shallow eyes, medium to large tuber size. Light skin color--too light for fresh market, but may be ok for processing. Trace of misshapened tubers. Appears to have yielding ability.
WIS75-30	- Round to oval tuber shape with some tubers being quite flattish. Buff appearance with light netting. Irregular surface and trace of second growth. No.	ND2676-10	- Round to slightly oval tubers with medium buff appearance. Seems to be tendency for red blotchy areas on surface. Tendency for irregular surface. Tubers tend to be small. Large tubers tend to be misshapened. Doubtful future.
Russet Norkotah	-Oval to oblong to long tubers with uniform netting, light russetting, trace of misshapened tubers. Major problem: lack of uniform shape. Doubtful future for fresh market-processing??	Red Pontiac	- Round to slightly oval tubers with a pink color. Major problems: knobiness and tendency to be misshapened. No future.
Snowden	- Round to blocky tubers with tan appearance and heavy netting--"scurfy" texture. Deep apical end and deep stem end. Poor appearance. No future for fresh market--may try for processing.	MSB073-2	- Round to oval shaped tubers with light tan appearance and with some netting. Wide range in shape. Major defects: knobiness, irregular surface, and poor appearance. No future.
Atlantic	- Round tubers with light tan appearance and medium netting. Eyes tend to be indented. Apical end is slightly indented. Stolon end is slightly indented. Large tubers tend to be misshapened. No future for fresh market--ok for processing.	MSE192- 8RVS	- Oblong to long tubers with medium to heavy russetting. Knobiness is serious problem. Irregular surface--even with smaller tubes. No future.
Russet Burbank	- Oblong to long russet with light to medium russetting. Major defects or problems: second growth, knobiness, irregular surface. No future.	MSA 091-1	- Round to oval shaped tubers with buff appearance. Some netting, but not uniform. Irregular surface is major problem--also knobiness is problem. No future.
Norchip	- Round to slightly oval tubers with light buff appearance, tendency to be pear shaped at stolon end. Major	MSE 230-6	- Round to oval shaped tubers with buff appearance and some netting--ranging from light to medium netting. Shallow eyes. Wide range in size--from small to large. Small tubers

- tend to be pear shaped and irregular surface. Poor appearance. No future.
- W1151 - Round to oval to oblong tubers with
RUSS light russetting and "scurfy" tuber appearance. Many misshapened tubers. The oblong tubers tend to be curved. Trace of second growth. Tendency for tubers to have pinkish cast. No future.
- W1335-1 - Round to slightly oval shaped tubers with medium to heavy netting, buff appearance, and tendency to be "scurfy". Many small potatoes. Stolons tend to be attached. Poor appearance. No future.
- W1348- - Oblong to long tubers with light to
RUSS medium russetting, many tubers have irregular surface. Wide range in size. Much variation in tuber shape. Poor appearance.
- W1313 - Round tubers with shallow eyes. Some tubers are flattish. Many tubers have irregular surface. The netting will vary from no netting to fairly heavy netting. No future for fresh market, but perhaps processing.
- NY121 - Round to slightly oval tubers with some tubers tending to be "flattish". Apical end tends to be indented. Eyes are indented. Wide range in size. Many tubers have an irregular surface.
- R41-11 - Round to slightly oval tubers with buff appearance and some tubers have light netting while other tubers have a "scurfy" appearance. Larger tubers have a "folded" apical end. Poor appearance — No future.
- NY122 - Round to slightly oval shaped tubers with buff appearance, and with light netting. Some "knobbiness". Major problem: irregular surface and misshapeness. No future.

Ohio Table 1. 1998 Observation trial yield data on promising selections, Wooster, OH.							
Cultivar or Selection	Stand %	Total cwt/A	US No. 1 cwt	Plant Maturity	US No. 1 %	B-Size %	Cull %
AF 1938-2	93	356	217	7	61	16	23
B1463-1	93	261	198	3	76	25	22
B1492-6	87	348	287	9	83	5	13
B1415-7	77	261	176	9	67	3	30
B1240-1	93	363	249	9	69	1	30
B1240-14	90	341	273	7	80	4	16
B1710-8	70	266	221	5	78	6	11
B1758-14	90	283	212	3	75	10	15
B1752-5	93	215	133	3	62	10	28
Langlade	77	319	270	9	85	2	14
LA 12-88	83	266	184	7	69	3	28
NYS 31-7	100	232	146	7	63	11	24
NYS 34-3	73	208	128	7	62	8	31
CF 7523-1	63	190	164	7	86	5	9

Ohio Table 2. 1998 Observation trial tuber ratings on promising selections, Wooster, OH.

Cultivar or Selection	Skin ¹ Color	Skin ¹ Texture	Tuber ¹ Shape	Eye ¹ Depth	Overall ¹ Appearance
AF 1938-2	7	7	3	7	7
B1463-1	5	3	6	7	7
B1492-6	2	6	2	5	7
B1415-7	5	5	2	6	5
B1240-1	6	5	2	7	6
B1240-14	7	6	2	7	7
B1710-8	7	7	2	6	7
B1758-14	2	6	2	5	6
B1752-5	7	6	2	5	6
Langlade	7	7	2	5	6
LA 12-88	2	6	2	5	5
NYS 31-7	7	6	3	5	6
NYS 34-3	7	6	2	7	7
CF 7523-1	7	7	3	5	5
¹ See standards for NE-184 system.					

Ohio Table 3. 1998 Observation trial internal tuber ratings, specific gravity, and chip color on promising selections, Wooster, OH

Cultivar or Selection	Specific Gravity	Chip ¹ color	Agtron ²	Blisters ⁴ %	Hollow Heart ³	Internal ³ Discolor	Necrosis ³	Stem-end ³ Discolor	Vascular ³ Discolor	Defect ³ Free	Tuber ⁵ Flesh color
AF 1938-2	1.081	1	65	0	0	0	0	0	0	10	W
B 1463-1	1.073	2	58	20	0	0	0	0	0	10	W
B 1492-6	1.079	2	57.7	40	0	0	0	0	0	10	Y
B 1415-7	1.079	1	60.0	10	0	0	0	0	0	10	W
B 1240-1	1.084	1	62.8	10	0	0	0	0	0	10	W
B1240-14	1.084	2	59.7	10	5	0	0	0	0	5	W
B1710-8	1.071	1	59.8	10	0	0	0	0	0	10	W
B1758-14	1.078	2	58.6	0	0	0	0	0	0	10	L.Y.
B1752-5	1.073	3	52.5	0	0	0	0	0	0	10	Y
Langlade	1.078	2	58.9	10	0	0	0	0	0	10	W
LA 12-88	1.080	1	61.9	0	0	0	0	0	0	10	W
NYS 31-7	1.077	2	60.7	0	1	0	0	0	0	9	Y
NYS 34-3	1.088	2	59.6	10	0	0	0	0	0	10	W
CF 7523-1	1.080	1	61.4	10	0	0	0	0	0	10	W

¹ SFA Standard² Agtron 350³ Based on 10 tubers per sample (average of two replications)⁴ Percentage of chips that develop blisters greater than 20mm in diameter during the frying process. See standard NE-184 rating system.⁵ Tuber flesh color: W = white, L.Y. = light yellow, Y = yellow

Ohio Table 4. Observation trial breeding lines which may need further evaluations, Wooster, Ohio 1998

Cultivar or Selection	Stand %	Maturity Scale	Total cwt/A	Cultivar or Selection	Stand %	Maturity Scale	Total cwt/A	Cultivar or Selection	Stand %	Maturity Scale	Total cwt/A
W94-4172-1	100	7	184	B1710-8	70	5	266	LA21-195	43	9	271
AF1611-6	67	7	230	B1529-1	60	7	194	LA01-221	87	3	218
AF1938-2	93	7	356	B1739-1	83	9	184	LA22-218	80	7	208
AF1455-20	83	7	278	B1758-14	90	3	283	LA12-114	63	5	206
AF1773-1	90	9	298	B1749-5	83	5	232	LA22-187	77	7	174
AF1921-9	67	5	261	B1761-10	97	7	266	LA22-84	63	7	169
AF1896-5	90	7	227	B1523-4	57	9	218	LA12-115	90	9	261
AF1606-8	80	7	278	B1758-3	90	3	252	LA23-02	77	9	218
AF1775-2	80	9	312	B1752-5	93	3	215	LA22-143	37	9	174
AF 1753-1	93	5	286	B1758-2	97	3	283	LA11-36	53	9	213
AF1938-3	77	7	259	B1753-1	83	5	261	LA01-222	97	2	266
B1761-2	90	5	252	B1756-1	87	7	240	LA72-12	83	9	252
B1521-2	87	9	281	B1749-15	57	9	ND	LA12-88	83	7	266
B1763-5	97	5	261	B1749-10	70	7	ND	LA93-84	97	7	198
B1739-3	83	5	232	B1709-5	73	5	ND	LA12-86	33	9	167
B1763-2	97	5	213	B1709-4	87	7	223	LA01-212	97	5	261
B1524-2	87	7	230	B1703-3	90	5	257	LA21-145	93	7	198
B1522-1	87	7	201	B1522-6	83	7	259	NYS32-2	100	9	261
B1526-1	80	7	169	B0811-4	6-	3	203	NYS27-2	90	5	261
B1749-1	90	7	198	B1711-16	73	5	252	NYS4-2	77	7	266

Ohio Table 4. Continued.

Cultivar or Selection	Stand %	Maturity Scale	Total cwt/A	Cultivar or Selection	Stand %	Maturity Scale	Total cwt/A	Cultivar or Selection	Stand %	Maturity Scale	Total cwt/A
NYS31-7	100	7	232	UNO	97	5	208	B1492-10	90	7	208
NYS34-3	73	7	208	Pepo	97	9	213	H0967-11	87	7	368
NYS4-3	83	5	211	Azur	97	7	211	B1492-6	87	9	348
NYS300-1	97	5	225	Panda	100	9	194	B1415-7	77	9	261
NYS300-13	97	7	211	Satina	87	9	283	H0984-1	90	9	281
NYS300-9	100	7	189	Rosara	100	9	271	B1435-15	97	7	266
NYS3-1	77	9	201	Agata	100	7	290	B1338-27	100	5	295
NYS31-1	80	9	348	Picasso	97	9	305	B1145-2	87	3	310
NYS26-2	80	7	208	Prouetna	97	9	344	B1240-1	93	9	363
NYS28-2	77	7	290	Cosmos	97	9	203	B1240-14	90	7	341
NYS106-17	83	7	169	CF7523-1	63	7	203	B1493-3	87	7	218
NYS31-3	53	9	223	AF1753-12	100	7	341	B1491-20	90	3	247
NYS33-5	80	7	152	AF1758-7	90	7	310	B1425-9	90	9	319
NYS14-2	77	7	201	B1429A-3	97	7	307	B1495-6	87	5	237
NYS300-7	97	7	165	B0985-1	93	5	194	B0852-7	100	7	264
NYS32-3	93	7	254	B0766-3	97	7	240	B1321-21	77	9	286
WISC1368	93	5	266	B1493-8	83	7	232	B1603-11	97	7	324
WISC1386	80	5	308	B1492-12	93	9	198	B1102-3	93	3	276
WISC1301	80	7	150	B0178-34	87	9	341	Langlade	77	9	319
WISC1374	83	7	237	B1491-5	93	5	286				
WISC1431	93	7	257	B1493-1	83	9	227				

Ohio Table 5. Yield, marketable yield, percent of yield by grade size distribution and specific gravity for varieties grown at Wooster, Ohio, 1998. (NE-184)

Cultivar or Selection	Total Yield cwt/A	Marketable Yield		% of Total Yield ²			Specific Gravity
		US#1 cwt/A	% of Std ¹	US#1 >1 7/8"	B Size	Culls	
Standard							
Atlantic	264	180		68	6	26	1.088
Katahdin	273	205		75	5	21	1.073
Kennebec	252	151		60	9	31	1.079
Superior	242	167		69	4	27	1.076
Avg.	258	176		68	6	26	
AF1437-1	233	158	90	68	6	26	1.073
AF1480-5	237	154	88	65	12	22	1.079
Snowden	275	217	123	79	7	14	1.086
AF1615-1	272	196	111	72	12	15	1.083
BO564-8	300	231	131	77	11	12	ND ³
BO811-13	224	172	98	77	6	17	1.081
BO766-3	250	158	90	63	7	31	1.079
BO856-4	266	173	98	65	10	25	1.077
Yukon Gold	310	248	141	80	4	16	1.079
AF1565-12	302	230	131	76	7	17	1.074
AF1424-7	310	223	127	72	6	21	1.084
Nordonna	186	115	65	62	26	12	1.070
Dark Red Norland	289	205	116	71	11	19	1.073
NY103	252	176	100	70	8	22	1.077
NY102	236	163	93	69	5	25	1.085

¹% of standard is based on the average % of the four standard cultivars listed.

²May not equal 100 because of rounding off

³ND means no data available.

Ohio Table 6. Tuber shape and appearance, hollow heart ratings, internal necrosis ratings and chip color for varieties grown at Wooster, Ohio - 1998 (NE-184)

Cultivar	Plant ¹ Maturity	Tuber ¹ Shape	Appearance ¹	Hollow Heart	Internal Necrosis	Chip ² Color
Standard						
Atlantic	6	2	5	0	0	1
Katahdin	8	3	5	0	0	1
Kennebec	6	5	3.5	0	0	2
Superior	4	3	5	0	0	1
AF1437-1	6	3	5.5	0	0	1
AF1480-5	7	3.5	4.6	0	0	1
Snowden	6	2	4	0	0	2
AF1615-1	7	3	7	0	0	1
BO564-8	4	2	6	0	0	ND ³
BO811-13	6	3.5	7	0	0	1
BO766-3	8	2	7	0	0	1
BO856-4	6	4.5	5.5	0	0	1
Yukon Gold	6	3	7	0	0	2
AF1565-12	5	2	7	0	0	2
AF1424-7	6	2.5	6	0	0	2
Nordonna	5	2	7	0	0	1
Dark Red Norland	4	4	6	0	0	2
NY103	6	2.5	7	0	0	1
NY102	7	3	5.5	0	0	1

¹See NE-184 Rating System

²Snack Food Association Standard

³ND means no data

Ohio Table 7. Plant stand, percent blister, agron readings, and additional tuber data for varieties grown at Wooster, Ohio - 1998 (Northeast 184).

Cultivar	Stand %	Chip Blister %	Agron E-5F	Tuber Data		
				Skin Texture	Eye Depth	Skin Color
Standard						
Atlantic	90	10	63.5	5	5	5
Katahdin	80	10	61.2	7	5	6.5
Kennebec	93	0	56.6	7	4.5	6.5
Superior	87	10	63.1	6	4.5	7
AF1437-1	83	0	62.1	7	5.5	6
AF1480-5	93	0	60.0	7	4.5	7
Snowden	93	0	58.9	5	4.5	4.5
AF1615-1	90	10	65.2	6	7	6
BO564-8	93	ND ³	ND	6	4.5	7
BO811-13	93	0	63.0	6	5	1
BO766-3	80	0	65.4	7	7	7
BO856-4	80	0	61.7	4	7	5.5
Yukon Gold	90	0	58.7	6	7	6
AF1565-12	93	0	60.1	6	6	6.5
AF1424-7	93	0	60.7	6.5	6	7
Nordonna	93	0	61.6	7	5.5	2
Dark Red Norland	93	10	60.8	6	5.5	2
NY103	87	10	63.3	8	7	7
NY102	87	10	60.0	7.5	6.5	7

¹Percentage of chips that develop blisters greater than 20mm in diameter during the frying process

²See NE-184 rating system

³ND means no data

OHIO POTATO CULTIVAR CONSUMER COOKING EVALUATIONS

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Industries Center Pilot Plant

Project Funded by:
Ohio Vegetable and Small Fruit Research and
Development Program

PROJECT OBJECTIVES:

For many years, potato cultivars have been evaluated at the OSU Food Industries Center for chipping quality. This information has been used by growers and chippers alike in selecting the cultivars that best suit their needs. Until 1996, however, no potato evaluation testing had been done to identify the quality attributes consumers find after potatoes have been prepared as boiled, mashed, baked and fried for home or commercial use. During the first year of our studies in 1996, we developed basic parameters for each of the preparation methods. Last year, we improved our evaluation techniques and our reporting format and we have continued the same reporting this year.

MATERIALS AND METHODS:

Thirteen cultivars were chosen by persons familiar with potato production and delivered to the Food Industries Center Pilot Plant. The selected cultivars were grown under the same conditions at the Ohio Agricultural Research and Development Center, Wooster, Ohio. Each of the cooking methods required different preparation and procedures. These procedures will each be listed separately.

1) Boiled Potatoes

Potatoes were peeled in an abrasive peeler for three minutes, hand trimmed where necessary and cut uniformly so that fairly uniform sizes could be obtained for cooking. The cut potatoes were held in cold water until placed in boiling water for twenty minutes. For the size of our pieces, this gave an adequate cook. Cooking was accomplished in small steam jacketed kettles where water was kept at a low, rolling boil throughout the twenty minute cook. After cooking, the potatoes were allowed to drain and placed on grading trays for evaluation.

2) Mashed Potatoes

Potatoes prepared as for boiled potatoes were

transferred to a mixing bowl and mixed with a home hand-held mixer. Mixing was started at slow speed, increased to medium speed and then finally given a high speed whip. Mixing time was about 30 seconds for each test. No ingredients were added.

3) Baked Potatoes

The unpeeled potatoes were selected for uniformity of size, approximately 2-1/2" to 3" in diameter, washed and placed on metal cooking sheets. Potatoes were then placed in a pre-heated 350°F oven and cooked for one hour.

4) Fried Potatoes

Potatoes were peeled in an abrasive peeler for three minutes to remove the majority of peel so that only minor hand trimming was necessary. The potatoes were sliced to a thickness of 1/8" in a Hobart slicer and deposited directly into water. Frying was done on an open grill with a temperature of approximately 350°F. A heavy coating of oil was applied to the grill and 18-20 potato slices added. The slices were turned to coat them with oil, pulled into a pile and cooked under an aluminum cap for fifteen minutes. After the first five and second five minute cooking interval, the potatoes were turned to obtain uniform cooking and color development and then recovered for evaluation.

Evaluation was principally subjective with the exception of specific gravity measurements. A scale of 1-5 was used to evaluate each quality attribute, with 1 being good and 5 being undesirable. On these scales, 3 was an average grade. In addition, descriptive comments were made for most observations.

RESULTS AND DISCUSSION:

The attached data gives the results of our consumer cooking evaluation tests. The most striking conclusion for those conducting the test was the variability and differences among cultivars. It seems evident that this type of evaluation procedure should continue and that new cultivars be evaluated in order to information to be supplied to consumers and growers concerning the cooking qualities of new cultivars.

We have known that differences existed, but the degree of difference was striking. With some cultivars the different method of cooking made a substantial difference in acceptance of the various quality factors.

Ohio Cooking Table 1. Evaluation of AF1565-12 (specific gravity=1.074) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:		2			
Small amount of veining in the potato					
COLOR:	1				
Nice white, uniform color					
FLAVOR:		2			
Mild, but doesn't have much potato flavor					
TEXTURE:	1				
Smooth, not sticky or grainy					
MASHED:					
DEFECTS:	1				
No defects					
COLOR:	1				
White, very nice color					
FLAVOR:		2			
Mild, but lacks a little in potato flavor					
TEXTURE:	1				
Very smooth, not pasty, sticky, or grainy					
BAKED:					
DEFECTS:		2			
Eyes protrude into the potato					
COLOR:			3		
Dark around the outside					
FLAVOR:					5
Very strong field flavor, or old flavor					
TEXTURE:				4	
Mushy, almost soupy					
FRIED:					
DEFECTS:	1				
No defects					
COLOR:		2			
Color was a little light, but what developed was a golden brown					
FLAVOR:		2			
Good fried potato flavor with no off flavor					
TEXTURE:	1				
Smooth, no graininess, not pasty.					

Ohio Cooking Table 2. Evaluation of Superior (specific gravity=1.076) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:			3		
Some veining and circular dark rings a quarter of an inch in from the surface					
COLOR:			3		
Lacks uniformity and has a somewhat gray, translucent appearance					
FLAVOR:		2			
Mild, rather bland					
TEXTURE:		2			
Smooth, but a little pasty and sticky					
MASHED:					
DEFECTS:	1				
No defects					
COLOR:		2			
A small amount of gray					
FLAVOR:		2			
Mild, bland					
TEXTURE:			3		
Pasty, not quite as smooth as some					
BAKED:					
DEFECTS:		2			
A fair amount of deep eyes					
COLOR:			3		
Rather gray					
FLAVOR:		2			
A little green, not real strong, but not overly objectionable					
TEXTURE:		2			
Fairly smooth, moist, not sticky.					
FRIED:					
DEFECTS:	1				
No defects					
COLOR:		2			
Fairly good golden brown color development					
FLAVOR:		2			
Fairly mild with a small amount of potato flavor					
TEXTURE:			3		
Smooth, but a little mushy and sticky					

Ohio Cooking Table 3. Evaluation of W1313 (specific gravity=1.094) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:		2			
Very slight discoloration around the surface					
COLOR:			3		
Lacks brightness and uniformity, with some yellowing					
FLAVOR:			3		
Green, off flavor					
TEXTURE:			3		
Grainy and sticky					
MASHED:					
DEFECTS:	1				
No evident defects					
COLOR:		2			
White, but some pasty appearance					
FLAVOR:			3		
Somewhat green flavor, leaving a little bit of an off taste					
TEXTURE:			3		
Gritty, but at the same time, a little pasty					
BAKED:					
DEFECTS:	1				
No apparent defects					
COLOR:	1				
Very nigh light, white color					
FLAVOR:		2			
Mild, no off flavor					
TEXTURE:	1				
Firm, not mealy or gritty, good texture					
FRIED:					
DEFECTS:	1				
No defects					
COLOR:			3		
Color development was not as good as some					
FLAVOR:			3		
Little bit of a bitter, off flavor					
TEXTURE:		2			
Not quite grainy, but lacking in smoothness					

Ohio Cooking Table 4. Evaluation of AF1424-7 (specific gravity=1.084) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH	MED		LOW	
	1	2	3	4	5
BOILED:					
DEFECTS:		2			
A small amount of discoloration at the surface					
COLOR:		2			
Some yellowing					
FLAVOR:					
Fairly mild, no off flavor, lacking a little in potato flavor					
TEXTURE:			3		
A little dry and crumbly					
MASHED:					
DEFECTS:	1				
No defects					
COLOR:		2			
Just a little yellow					
FLAVOR:		2			
Mild					
TEXTURE:	1				
Fluffy, a little drier than some, but not objectionable					
BAKED:					
DEFECTS:			3		
Internal veining, some translucent color at the surface					
COLOR:		2			
A little gray					
FLAVOR:		2			
Mild, not off flavor					
TEXTURE:				4	
Moist, waxy, pasty					
FRIED:					
DEFECTS:			3		
Some wrinkling on surface, and development of a "skinning" on the surface					
COLOR:		2			
Fairly good golden brown color development					
FLAVOR:	1				
Pretty good flavor					
TEXTURE:	1				
Smooth, not grainy or sticky					

Ohio Cooking Table 5. Evaluation of AF1615-1 (specific gravity=1.083) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:			3		
Some dark, non-fibrous strands or threads running through tuber					
COLOR:		2			
A little on the yellow/gray side					
FLAVOR:	1				
Mild potato flavor					
TEXTURE:		2			
Light, just a very small amount of pastiness					
MASHED:					
DEFECTS:			3		
A light, non-fibrous strand showing up in the mashed product					
COLOR:		2			
A little on the gray side					
FLAVOR:	1				
Mild and potato-like					
TEXTURE:		2			
Pretty light, not sticky					
BAKED:					
DEFECTS:	1				
No apparent defects					
COLOR:		2			
Just a little gray, with a small amount of streaking					
FLAVOR:	1				
Mild, nice potato flavor. No after flavor					
TEXTURE:			3		
Pasty, smooth, a little sticky					
FRIED:					
DEFECTS:	1				
No defects					
COLOR:		2			
A little lacking in golden brown coloration					
FLAVOR:	1				
Good, mild potato flavor					
TEXTURE:	1				
Smooth, not grainy or sticky					

Ohio Cooking Table 6. Evaluation of Katahdin (specific gravity=1.073) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH	MED		LOW	
	1	2	3	4	5
BOILED:					
DEFECTS:		2			
Some internal cracking during boiling					
COLOR:		2			
Yellowish appearance					
FLAVOR:		2			
Mild, with just a hint of the green flavor					
TEXTURE:		2			
Not real smooth, but not yet grainy					
MASHED:					
DEFECTS:	1				
No defects					
COLOR:		2			
A little yellow					
FLAVOR:		2			
Mild but not really heavy on potato flavor					
TEXTURE:		2			
Fairly light, but with some tastiness starting					
BAKED:					
DEFECTS:	1				
No apparent defects					
COLOR:		2			
Fairly uniform, a little yellowish					
FLAVOR:	1				
Mild potato flavor					
TEXTURE:	1				
A little firm, not real sticky or pasty					
FRIED:					
DEFECTS:	1				
No apparent defects					
COLOR:		2			
Good light golden browning and a pleasant yellowing of the un-browned surface					
FLAVOR:			3		
Very mild, with virtually no flavor at all					
TEXTURE:			3		
Rather waxy and pasty					

Ohio Cooking Table 7. Evaluation of Yukon Gold (specific gravity=1.079) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:	1				
No apparent defects					
COLOR:		2			
Nice yellow color, but a lack of uniformity					
FLAVOR:		2			
Some green flavor, not quite to the off flavor					
TEXTURE:		2			
Bone dry and crumbly					
MASHED:					
DEFECTS:	1				
Only a very slight amount of soft veining apparent					
COLOR:	1				
Nice bright yellow color					
FLAVOR:			3		
Green, field, undesirable flavor					
TEXTURE:		2			
Too dry, not real smooth					
BAKED:					
DEFECTS:	1				
No apparent defects					
COLOR:	1				
Nice yellow color					
FLAVOR:				4	
Musty, sort of an off-flavor					
TEXTURE:		2			
Fairly smooth and not pasty or sticky					
FRIED:					
DEFECTS:		2			
Skinning and some loose surface skin					
COLOR:		2			
The golden brown color associated with white potatoes developed poorly; however, the yellow coloring looks very attractive					
FLAVOR:	1				
Nice sweet flavor					
TEXTURE:		2			
A little sticky					

Ohio Cooking Table 8. Evaluation of Dark Red Norland (specific gravity=1.073) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:	1				
No apparent defects					
COLOR:	1				
Nice uniform, light color					
FLAVOR:		2			
Just a hint of field flavor					
TEXTURE:		2			
A little dry					
MASHED:					
DEFECTS:	1				
No apparent defect					
COLOR:	1				
Nice white color					
FLAVOR:	1				
Very mild, nice potato flavor					
TEXTURE:	1				
Smooth, not grainy or sticky					
BAKED:					
DEFECTS:		2			
Many eyes, some darkening at the edge					
COLOR:		2			
Very uniform, a little gray, little translucent					
FLAVOR:		2			
Strong, bitter potato flavor					
TEXTURE:		2			
Firm, fairly moist and smooth					
FRIED:					
DEFECTS:	1				
No apparent defects					
COLOR:			3		
There was no golden brown color development					
FLAVOR:			3		
Very mild, just no flavor					
TEXTURE:	1				
Smooth, not sticky or grainy					

Ohio Cooking Table 9. Evaluation of Langlade (specific gravity=1.078) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:			3		
Some darkening around the outside with dark rings in places					
COLOR:			3		
A fair amount of graying on the surface, lack of uniform color					
FLAVOR:		2			
Fairly mild					
TEXTURE:		2			
A little dry and mealy					
MASHED:					
DEFECTS:	1				
No apparent defect					
COLOR:		2			
A little translucent gray in coloring					
FLAVOR:		2			
A little bit of a harsh flavor, but not really off					
TEXTURE:		2			
Rather smooth, with a little mealiness					
BAKED:					
DEFECTS:				4	
Very dark spots at the edge, with circular discoloration all the way around the tuber, some veining					
COLOR:				4	
Lack of uniformity, translucent veining, gray					
FLAVOR:	1				
Mild					
TEXTURE:		2			
Potato is very hard, but is not mealy or sticky					
FRIED:					
DEFECTS:				4	
Hollow heart, with substantial amount of discoloration					
COLOR:			3		
There was a lack of good, light brown color, and the background color is somewhat yellow & gray					
FLAVOR:		2			
Typical fried potato flavor					
TEXTURE:		2			
Fairly smooth, with a small amount of graininess					

Ohio Cooking Table 10. Evaluation of CF7523-1 (specific gravity=1.080) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:	1				
No apparent defects					
COLOR:		2			
Light white, but some color variation					
FLAVOR:		2			
Very mild, virtually no flavor					
TEXTURE:		2			
A little pasty					
MASHED:					
DEFECTS:	1				
No apparent defect					
COLOR:	1				
A rather bright white with a slight yellow tinge					
FLAVOR:		2			
Very mild, virtually no taste					
TEXTURE:		2			
A little pasty and sticky					
BAKED:					
DEFECTS:		2			
Evidence of slight amount of hollow heart and some greening at the surface					
COLOR:	1				
Just slightly yellow, but it is a very pleasant appealing color					
FLAVOR:		2			
Mild, actually lacking in flavor. There is a slight amount of metallic after taste					
TEXTURE:		2			
Smooth, a little sticky. Fairly moist					
FRIED:					
DEFECTS:		2			
A small amount of skinning and vein development					
COLOR:	1				
Very good fried potato caramel color development					
FLAVOR:	1				
Mild					
TEXTURE:			3		
Rather sticky and pasty					

Ohio Cooking Table 11. Evaluation of Atlantic (specific gravity=1.088) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:			3		
Evidence of hollow heart. Some dark spots					
COLOR:		2			
Lack of uniformity of color					
FLAVOR:			3		
Field flavor, slightly off					
TEXTURE:			3		
Kind of grainy, a little bit mealy					
MASHED:					
DEFECTS:			3		
There were a number of hard chunks that did not mash					
COLOR:		2			
Starting to gray slightly					
FLAVOR:		2			
Field flavor					
TEXTURE:			3		
Grainy with hard lumps					
BAKED:					
DEFECTS:	1				
No apparent defects					
COLOR:		2			
Some graying around the edge and the appearance of some veining					
FLAVOR:			3		
A very strong potato flavor, more than what is desirable					
TEXTURE:		2			
Firm, not sticky or mealy					
FRIED:					
DEFECTS:	1				
No apparent defects					
COLOR:	1				
Good golden color development					
FLAVOR:	1				
Mild, no off flavor					
TEXTURE:	1				
Smooth, not grainy or sticky					

Ohio Cooking Table 13. Evaluation of B1752-5 (specific gravity=1.073) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:				4	
Several large corky pieces on the internal part of the potato					
COLOR:		2			
Good yellow color, but lacking some uniformity					
FLAVOR:				4	
A field, musty, off flavor					
TEXTURE:			3		
Rather coarse					
MASHED:					
DEFECTS:			3		
Pieces of corky tissue distributed throughout the product					
COLOR:	1				
Nice yellow color					
FLAVOR:			3		
A field, musty, off flavor					
TEXTURE:			3		
Coarse					
BAKED:					
DEFECTS:				4	
Corky tissue throughout the tuber					
COLOR:		2			
Fairly uniform yellow					
FLAVOR:			3		
Kind of an after taste that tends to linger					
TEXTURE:				4	
Very uneven with some very hard large grains					
FRIED:					
DEFECTS:		2			
One slice has a fair amount of corky tissue at the surface					
COLOR:		2			
The golden brown color development is rather mottled and not very uniform					
FLAVOR:		2			
Mild with a slight amount of green flavor					
TEXTURE:		2			
Slightly sticky and grainy					

Ohio Cooking Table 12. Evaluation of NorDonna (specific gravity=1.070) for consumer consumption following various cooking preparations.

EVALUATION:	RATING SCALE				
	HIGH		MED		LOW
	1	2	3	4	5
BOILED:					
DEFECTS:		2			
Some red spots on the interior of the potato					
COLOR:		2			
Lack of uniformity and a slight graying					
FLAVOR:		2			
Mild and a little starchy					
TEXTURE:		2			
Smooth, but rather sticky					
MASHED:					
DEFECTS:	1				
No apparent defects					
COLOR:		2			
Light, grayish, transparent					
FLAVOR:			3		
Mild, starch					
TEXTURE:			3		
Pasty, sticky					
BAKED:					
DEFECTS:		2			
A lot of eyes					
COLOR:		2			
Fairly uniform, translucent color					
FLAVOR:	1				
Good potato flavor, typical of what you would expect in a baked potato					
TEXTURE:		2			
A little mush, pretty smooth					
FRIED:					
DEFECTS:		2			
Where some of the red skin was left on the potato, it bled into the flesh during frying					
COLOR:	1				
Nice golden brown fried color					
FLAVOR:		2			
Mild potato flavor					
TEXTURE:		2			
Smooth, but a little sticky					

Oregon

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Introduction

Releases and promising selections--

Oregon released two cultivars in cooperation with Washington, Idaho, Colorado and the ARS/USDA in 1998. Umatilla Russet (tested as AO82611-7) is a long, multipurpose russet with excellent processing potential. No. 1 yields are typically higher than those of Russet Burbank and both external and internal defects are much less obvious. Umatilla fry color and solids are also typically better. Umatilla is relatively resistant to sugar-end fries.

Both Umatilla and the second release, Russet Legend, are markedly resistant to late blight tuber decay compared to Ranger Russet, Norkotah and Shepody. Like Umatilla, Legend has excellent processing characteristics with higher solids and better fry color than Russet Burbank. It also produces higher No. 1 yields. Unfortunately, Russet Legend is susceptible to occasionally severe stem-end discoloration. Growers are cautioned not to store Legend until the problem is better understood and can be managed and/or they have substantial experience with Legend on their farm(s). Additional information about these cultivars, including production guidelines, are available from the authors or on-line at <http://www.css.orst.edu/potatoes> (click on "cultural management", then "varieties", then "production guide" for either Umatilla or Legend).

Oregon is contemplating the release of 1 or more red clones in 1999 or 2000 depending on seed supplies. Other selections being seriously considered for release include AO87277-6, a multipurpose russet with excellent processing potential, and AO85165-1, a long fresh market russet with little processing potential. Details are available from the authors.

1998 Trials--

Potato varieties and selections were evaluated on 4 branch experiment stations (See Oregon Statewide Trial) and several Columbia Basin commercial farms and at Corvallis. Entries were primarily long russets for processing but also included chippers, reds and specialty varieties.

A substantial late blight field screening program was added at Corvallis in 1998. Approximately 25,000 single-hills, 500+ five-hills and 40 advanced selections and varieties were evaluated for both foliar and tuber resistance under fungicide-free conditions. Selections from the single- and five-hill plantings will be further evaluated for resistance and commercial worth. Results of replicated tests will be reported herein.

Oregon workers again produced 65,000+ tuberlings in Corvallis greenhouses and evaluated about 50,000 clones pre-selected for russetting in single-hill plantings at Powell Butte. Selections from earlier single-hill trials were evaluated in 4-hill, preliminary and replicated yield trials depending on level of advancement.

Methods

State-wide Trial--

All four statewide trials (Hermiston, Klamath Falls, Madras, Ontario) were grown using commercially recommended production practices for the testing sites. Comparisons were made using 4-replicate, randomized complete block experimental designs. Individual plots were single rows 25 ft. long. Diseases, insects and weeds were controlled using materials and rates recommended for the Pacific Northwest.

Corvallis Variety Trials--

Corvallis variety trials were planted on June 2 due to delayed spring rains. Individual plots were single rows 25 feet long containing 33 seedpieces and each entry was replicated 4 times. Sencor was applied at 0.5 lb a.i./acre. At least one red selection showed serious metribuzin injury. Di-Syston was used for insect control and

alternating applications of Dithane M-45 and Bravo provided acceptable late blight control. Vines were killed with Diquat at labeled rates on September 11 and plots were harvested on September 24.

Late Blight Screening--

Three late blight screening trials (25,000 single hills, 500+ five-hills and 40 replicated selections) were conducted at Corvallis in 1998. All three were planted in mid-June and grown without fungicides. Plots were inoculated once in late August. Inoculations were made by use of a hand-held pump-up sprayer containing a water suspension of the US-8 strain provided by Robin Ludy, Department of Botany and Plant Pathology, Oregon State University. Inoculum was applied on paired rows on a 30 x 30-foot grid throughout all three plantings.

Results and Discussion

Oregon Statewide Trial--

Twenty-five advanced selections were compared to five named standards at four locations in the Oregon Statewide Trial (Oregon Table 1). Thirteen entries (designated by + in Oregon Table 1) were retained for further evaluation. Of these, 8 were reserved for 1999 Oregon trials, 3 for western regional comparisons and 2 for the 1999 Tri-state Trial. AO87277-6, a long multipurpose russet, was probably the most promising entry with good yields, excellent processing potential and an overall appearance acceptable for fresh market. This selection also performed extremely well in the Corvallis advanced late blight screening trial where tubers were equal to or better in appearance than Russet Norkotah and Gem Russet (Oregon Table 11). AO85165-1, a long table-stock russet also yielded well and is being considered for release during the next year or two. AO85165-1 is not suited for processing because of high sugars and relatively low solids.

AO91812-1 has shown good chipping potential but is relatively late maturing. It may be well suited to long-season production areas.

Additional information (and some images) for statewide and more advanced Oregon clones is

available on-line at <http://www.css.orst.edu/coarc> (click on "Potato Variety Database").

Corvallis Chip Trials--

Eight entries were evaluated for chipping potential (Oregon Tables 2-4). Atlantic, showed 48% seedborne virus, mostly PVY, in mid-July (Oregon Table 3). Consequently, Atlantic yields were unrealistically low (Oregon Table 2). Other entries showed relatively little virus except for A88431-1 which was about 8% infected. Mild late blight symptoms were evident on foliage and tubers of most of the entries. Due to the relatively short growing season (June 2 - September 24), most entries showed excessive skin flaking and feathering at harvest (Oregon Table 3) indicating immaturity.

Chipeta led all entries in total yield (Oregon Tables 2, 3) but ranked only 4th in U.S. No. 1 yields. Tubers varied in size and shape, skins feathered fairly badly and lenticels were prominent. Chipeta tubers tended to green more than most and to be slightly more susceptible to growth cracks and vascular discoloration. The Oregon selection, AO91812-2, appeared to have considerable promise with good total and U.S. No. 1 yields and uniform appearance; chip color from 50°F was excellent on November 5 but poor on October 10 suggesting that further fry tests are needed. A89217-1, which led in No. 1 yields, is a long russet with no potential for chipping. It was placed in this trial by mistake. AO91812-1, with 46% sprouting on December 10, is clearly not a good storage potato without extraordinary sprout control measures. Both A89219-7 and AO90467-14 showed excessive hollow heart with 17.5 and 20%, respectively. It appears that none of the entries in this trial showed extraordinary potential compared to either Chipeta or Atlantic under normal virus pressure.

Red Trials--

Fifteen reds were compared in a typical 4-replicate, randomized complete block field trial. Dark Red Norland, Red LaSoda and Sangre were included as standards. Sangre lead in both total and U.S. No. 1 yield (Oregon Table 5) while Dark Red Norland ranked third in both

categories. Both cultivars produced relatively large tubers. Dark Red Norland remains a good choice for early red harvest. Sangre stores extremely well but skins are often paler than desirable.

Small tuber size is fully as important as high yields in the red market. Two of the Oregon entries, NDO2686-6 and NDO4300-1, were quite attractive with good color and tuber uniformity but only average yields. Tubers of NDO2686-6 were also quite small. CO89097-2 yielded well and also produced uniform tubers. It may have promise. NDO4588-5 ranked second in both total and U.S. No. 1 yields and merits further evaluation; tubers were uniform in size, suggesting that closer spacing may be highly advantageous with this selection. NDO4588-5, like most entries, showed enlarged lenticels (Oregon Table 6) due to relatively moist harvest conditions.

Most entries in this trial showed substantial levels of virus, mostly PVY, in mid-July (Oregon Table 6). Yields of AO92655-9, NDO2438-6 and NDO4592-3 were almost certainly reduced by viruses.

Gourmet/Specialty Varieties--

Unlike the other trials, virus symptoms were almost nonexistent among entries in the Specialty Trial (Oregon Tables 7, 8). Crispin and Dennis produced high yields of U.S. No. 1 potatoes as well as high total yields (Oregon Table 7). Tubers of both were attractive and uniformly shaped. Crispin flesh was notably yellow. German Butterball produced high total yields but graded out poorly due in large part to small tuber size. Red Gold tubers were red-skinned and yellow-fleshed. Red Gold was uniquely susceptible to insect and/or rodent damage in these trials and showed a tendency to sprout early in storage. Yukon Gold typically performed well with good yields of attractive round, pink-eyed, yellow-fleshed tubers. A79543-4 produced satisfactory yields of small, attractive round red tubers with slightly deep eyes.

Russet-skinned Comparisons--

AO92019-13, AO92173-2, A8495-1 (Russet

Gem) and AO90014-1 showed more than 10% virus infection in mid-July (Oregon Table 10). Yields for these entries may have been slightly reduced.

Based on yield, freedom from tuber defects and overall appearance, the Oregon selection AO87277-6 seemed to be the most promising entry in this trial (Oregon Table 9). It led in both total and No. 1 yields. Tubers were uniformly long, well-shaped and moderately russeted; specific gravities were high and both external and internal tuber defects were markedly low. Storage tests showed that AO87277-6 may have a short dormancy and require sprout inhibition for spring marketing.

A8495-1, to be named and released as "Russet Gem" in 1999, also produced attractive tubers but yields were somewhat low. AO85165-1, being readied for potential release by Oregon in 1999 or 2000, does not perform well in the Willamette Valley. As usual, tubers were not especially uniform in either size or shape and lenticels were enlarged. Tubers were quite susceptible to hollow heart (Oregon Table 10). AO92023-3 showed good yields and freedom from defects but eyes were slightly deep.

Entries worthy of further testing include A8495-1, A88338-1, AO85165-1, AO87277-6 and AO92023-3. AO87277-6 was by far the most outstanding among this group in 1998 Corvallis trials. Like many Aberdeen russet progeny, it appeared to have moderate to good resistance to late blight tuber decay in Corvallis trials (see Oregon Table 11).

Late Blight Screening--

Two late blight screening trials will be reported on herein. Results of a 4-replicate comparison of 40 advanced selections and named varieties are summarized in Oregon Table 11. Results of a second trial involving more than 500 5-hill (early-generation parental clones') plots will be verbally summarized.

Replicated Advanced Selections--

Because of hot, dry weather through August and most of September, severe late blight pressure did not develop until mid-September or even

later. For that reason, early maturing clones probably partially escaped tuber infection since vines were not present to favor spore development and movement to the tubers. Oregon Table 11 shows some unusual trends relative to preceding years. For example, Russet Norkotah, which has shown 30 to 50% tuber infection levels in previous Corvallis trials, showed only 12.5% of the tubers with obvious infection in 1998. In comparison, two later-maturing Norkotah selections, CORN (Colorado Russet Norkotah) 3 and CORN 4 showed almost 50% infection and severe decay. The standard Russet Norkotah clone obviously escaped late blight infection whereas the later-maturing Colorado selections did not. It is highly doubtful that the CORN selections are more susceptible than Norkotah under normal blight conditions.

As usual, Ranger Russet was extremely susceptible to decay with 50% infection. Shepody, on the other hand, seemed to have partially escaped with only 22.5% of the tubers showing symptoms. Some of the red selections, including NDO2686-6R and NDO2438-6R showed surprising tuber resistance. NDO2686-6R has shown fairly good field resistance in preceding trials in Oregon, Washington and elsewhere. The Oregon fresh market russet, AO85165-3, showed almost 50% infection and moderate decay.

Ratings of foliar infection and the relationship between foliar and tuber infection are sometimes confusing. It seems possible that 1998 Corvallis foliar ratings may have been partially confounded by plant senescence in early varieties before the onset of heavy disease pressure. The difference between naturally-senesced foliage and foliage killed by late blight is often difficult to distinguish without laboratory examination. Oregon Table 11 shows little if any relationship between foliar and tuber infection. For example, the only two entries showing zero tuber infection had 92 and 100% vine infection, respectively. The Atlantic seed source used in this trial showed almost 50% virus infection in chipping trials. It seems likely, therefore, that Atlantic died unusually early in this test and therefore partially escaped tuber infection. Atlantic is usually moderately susceptible to tuber decay.

Five-Hill, Unreplicated Observations--

Some 560 early-generation clones were planted in 5-hill plots at the OSU Lewis Brown farm. These represent potential parental breeding lines with known sources of resistance. Most have moderately acceptable tuber type. The trial was designed to evaluate these clones for both foliar and tuber resistance to late blight infection. Resistant clones, especially those with good tuber type and some tuber resistance, will be crossed by cooperators at Aberdeen Idaho and the resultant progeny will be included in the Oregon and Idaho programs for further evaluation and potential release.

A visual rating scale of 0 - 9 was developed to estimate foliar injury as follows:

<u>Rating</u>	<u>% Foliar Involvement</u>
0	No disease
1	Trace
2	1 - <5%
3	5 - 10%
4	10 - 20%
5	25 - 40%
6	40 - 60%
7	60 - 75%
8	75 - 90%
9	90 - 100%

Entries were evaluated for foliar infection by OSU and ARS cooperators on October 1 and by Crop Science workers alone on October 7. Most entries were rated at 7 or higher on the first inspection but at least 20 selections were rated 3 and 10 were rated as low as 2. By comparison, all commercial varieties were totally dead (rating of 9) on October 1.

Ninety-seven clones were saved because of good parental tuber type. Seven of these showed foliar infection levels of 5 and below and two were rated at 3 on October 7, long after all commercial varieties, even those with moderate resistance such as Russet Burbank, were dead, apparently from late blight.

Thirty-four of 79 clones selected as parents because of tuber type showed zero tuber infection. These numbers are extremely promising based on the fact that neighboring

commercial varieties showed up to 50% infection under identical unsprayed conditions.

It seems clear from these 5-hill comparisons and Oregon Table 11 that many preliminary and advanced Tri-State breeding selections have fair to good resistance to late blight tuber decay. These results strongly support the notion that high levels of tuber resistance to late blight infection are achievable through traditional breeding and selection.

Oregon Table 1. Average Performance of 30 Varieties and Advanced Selections at 4 Oregon Locations (Hermiston, Powell Butte, Klamath Falls, and Ontario), 1998

Selection ¹	Yield		%	Tuber	L/W	Sp.	Fry	Sug.	HH,	Bl.	Vine
	Total cwt/a	No. 1 cwt/a	No. 1 %	Size oz	Ratio	Grav.	Color USDA	Ends %	BC %	Spot %	Mat. 5=Late
R. Burbank	440	251	57	6.51	1.93	1.081	1.38	9	6	4	3.2
Ranger	446	332	74	8.13	1.94	1.087	0.93	1	1	3	3.3
Shepody	486	301	62	8.08	1.64	1.071	2.00	4	1	4	3.2
Norkotah	383	290	76	5.94	1.75	1.072	1.81	10	6	1	1.9
Atlantic	349	265	76	5.75	1.03	1.085	0.21	0	21	4	2.6
AO85165-1+	393	301	77	7.22	1.63	1.072	2.45	8	13	4	3.5
AO87277-6+	461	374	81	7.44	1.85	1.087	0.68	1	5	1	3.4
AO89128-4+	447	275	61	5.56	1.92	1.085	0.35	1	7	2	3.2
AO90014-1+	376	288	77	6.17	1.94	1.084	0.47	3	0	1	2.9
AO90319-1+	395	271	69	4.75	1.85	1.075	1.81	10	3	4	3.1
AO88103-3+	485	354	73	6.06	1.63	1.084	0.60	0	12	2	3.3
AO91812-1+	563	491	87	7.30	0.96	1.084	0.07	0	0	2	3.8
AO91812-1	614	400	65	6.73	1.06	1.084	0.18	1	1	2	4.3
AO92007-2+	427	333	78	6.78	1.95	1.080	1.33	8	5	5	3.0
AO92016-3	424	290	68	6.79	1.82	1.079	0.85	2	0	14	2.9
AO92017-6+	552	440	80	9.41	1.71	1.081	1.24	12	2	2	3.7
AO92019-13	439	293	67	7.89	1.92	1.084	2.48	18	6	7	4.0
AO92023-3	538	331	62	10.16	1.65	1.074	1.76	7	2	5	4.0
AO92173-2	518	388	75	6.73	1.67	1.076	1.69	13	11	0	3.9
COO93031-3+	473	399	84	8.23	1.87	1.074	2.04	2	1	4	3.3
AO92130-2	566	458	81	6.71	1.76	1.085	1.36	6	10	11	3.4
AO92246-3	411	315	77	5.49	1.66	1.079	0.68	2	5	3	3.6
AO92252-1+	448	350	78	7.33	2.00	1.084	1.07	6	2	15	3.2
AO92260-8	469	322	69	6.46	1.77	1.078	2.39	12	0	1	4.4
AO92270-4	445	329	74	6.55	1.69	1.086	1.03	4	1	3	3.4
AO92281-3	469	352	75	7.18	2.14	1.084	1.29	4	1	2	3.5
AO92303-3	441	325	74	5.40	1.81	1.093	0.73	1	25	3	2.9
AO92304-1	487	312	64	6.51	1.89	1.084	1.05	5	1	5	3.4
AO92378-1+	379	325	86	7.65	1.67	1.081	0.37	0	1	2	3.2
AO93317-5+	531	441	83	6.62	1.49	1.082	0.52	1	0	0	3.1

¹Entries followed by + were retained for further study, all others were discarded.

Oregon Table 2. Yield, Grade and Size Distribution of Eight Chipping Varieties and Selections at Corvallis, Oregon, 1998

Entry	Total (cwt/a)	U.S. No. 1, cwt/a				Yield (cwt/a)			Oz./ Tuber ¹
		Total	4-6 oz	6-10 oz	>10 oz	<4 oz	2's + Culls	% U.S. No. 1	
Atlantic	359	296	82	119	94	36	27	82	5.4
Chipeta	526	379	59	148	171	24	123	72	7.1
A88431-1	432	312	93	129	90	36	84	71	5.1
A89219-7	443	390	61	123	207	21	31	88	7.5
AC87340-2	412	292	141	132	19	58	62	71	3.8
AO90467-14	461	381	138	157	86	29	50	82	5.5
AO91812-1	473	367	128	152	87	42	64	77	5.0
AO91812-2	472	381	128	178	75	30	61	80	5.0
Mean	447	350	104	142	103	34.7	62.7	78	5.5
CV (%)	10.7	16.0	15.5	23.3	29.3	36.9	34.5	6.5	9.8
LSD (0.05)	70.5	82.2	23.7	48.8	45.0	18.8	31.8	7.5	0.8

¹ Total weight per plot/total number tubers per plot

Oregon Table 3. External and Internal Tuber Defects and General Characteristics of Eight Chipping Varieties and Selections at Corvallis, Oregon, 1998

Entry	External Defects (%) ¹			Internal Defects (%) ²			Comments
	K	GC	G	HH	VD	SEB	
Atlantic	0.0	1.0	1.7	7.5	2.5	0.0	48% virus-infected!
Chipeta	2.1	7.5	5.9	7.5	12.5	5.0	Uneven size; feathering; Lenticels
A88431-1	0.8	1.0	5.6	7.5	0.0	7.5	8% virus; feathering, lenticels
A89219-7	0.3	0.0	1.7	17.5	2.5	0.0	Long russeted tubers; flaking
AC87340-2	0.0	0.1	0.7	2.5	7.5	0.0	Even size and shape
AO90467-14	0.4	0.6	2.1	20.0	7.5	5.0	Skin flaking/feathering
AO91812-1	0.2	0.3	2.0	5.0	15.0	5.0	Ruptured lenticels
AO91812-2	0.1	0.5	2.9	0.0	7.5	2.5	Uniform size; flaking feathering
Mean	0.5	1.4	2.8	8.4	6.9	3.1	
CV (%)	112.5	85.4	73.1	92.9	126.5	230.3	
LSD (0.05)	0.8	1.7	3.0	11.5	12.8	10.6	

¹ K = Knobs, GC = Growth Cracks, G = Sunburn.

² HH = Hollow Heart, VD = Vascular Discoloration, SEB = Stem End Browning. Figures based on 10 U.S. No 1 tubers per replication.

Oregon Table 4. Specific Gravity, Fry Color and Sprouting Characteristics of Eight Chipping Varieties and Selections at Corvallis, Oregon, 1998

Entry	Spec. Grav. ¹ Oct. 29	Agtron Chip Color ^{2,3} (Nov. 5)		Agtron Chip Color (Oct. 10)		Percent Sprouted (Dec. 10)		Sprout Length ⁴ (Dec. 10)	
		40 °F	50 °F	40 °F	50 °F	40 °F	50 °F	40 °F	50 °F
Atlantic	1.093	24.1	38.3	23.3	39.3	0.0	0.0	0.0	0.0
Chipeta	1.087	22.5	36.4	19.9	35.5	0.0	0.0	0.0	0.0
A88431-1	1.109	27.0	41.4	27.3	35.7	0.0	0.0	0.0	0.0
A89219-7	1.103	26.6	40.7	23.0	38.8	0.0	0.0	0.0	0.0
AC87340-2	1.084	27.3	44.2	24.7	35.4	0.0	0.0	0.0	0.0
AO90467-14	1.112	29.6	37.5	26.7	36.9	0.0	0.0	0.0	0.0
AO91812-1	1.098	27.8	39.3	22.8	37.0	0.0	46.5	0.0	0.4
AO91812-2	1.097	21.4	41.7	20.8	34.3	0.0	0.0	0.0	0.0
Mean	1.098	25.8	39.9	23.6	36.6	0.0	5.8	0.0	0.05
CV (%)	0.439	10.7	6.9	9.5	14.9	0.0	77.8	0.0	83.3
LSD (0.05)	0.007	4.1	4.0	3.3	8.0	0.0	6.6	0.0	0.06

¹ Air/water method

² Agtron reflectance value (red filter), high numbers = light color

³ To determine PC/SFA value use the following formula: PCSFA = (Agtron value x -0.113) + 6.70984

⁴ Inches (values ≤0.125 = peeping)

Oregon Table 5. Yield, Grade, Size Distribution and Specific Gravities of 15 Red-skinned Varieties and Selections at Corvallis, Oregon, 1998

Entry	Total Yield (cwt/a)	Yield U.S. No. 1 (cwt/a)				Yield (cwt/a)		% U.S. No. 1	Oz/ Tuber ¹	Spec ² Grav
		Total	4-6 oz	6-10 oz	>10 oz	<4 oz	2's + Culls			
Dk. R. Norland	476	379	18	266	94	44	54	79	5.75	1.072
Red LaSoda	438	323	15	200	106	51	65	74	5.39	1.076
Sangre	537	408	25	203	179	37	93	76	7.06	1.079
AO92655-9	300	197	12	156	29	61	42	62	4.11	1.070
AO92657-3	364	269	30	192	47	77	18	72	3.98	1.076
CO89097-2	472	376	13	263	101	54	41	79	5.61	1.090
COO86107-1	436	347	17	274	57	60	29	80	4.96	1.083
DT6063-1	467	372	12	197	163	32	63	79	7.06	1.102
NDO2438-6	451	328	26	210	92	74	49	70	4.73	1.068
NDO2686-6	399	246	17	200	29	117	35	60	3.66	1.078
NDO4300-1	446	331	20	268	43	79	35	74	4.27	1.072
NDO4323-2	373	247	21	168	57	83	43	64	3.86	1.074
NDO4588-5	483	400	12	292	96	55	28	83	5.52	1.073
NDO4592-3	302	217	15	159	43	52	32	69	4.09	1.078
NDO5437-7	317	116	24	91	1	138	63	37	2.32	1.073
Mean	417	304	18	209	76	68	46	71	4.82	1.078
CV (%)	20.2	27.7	54	27	59	30	38	13	17.54	0.515
LSD (0.05)	120	120	14	82	64	29	25	13	1.21	0.008

¹ Total weight per plot/total number of tubers per plot

² Air/water method

Oregon Table 6. External and Internal tuber Defects and General Characteristics of 15 Red-skinned Varieties and Selections at Corvallis, Oregon, 1998

Entry	External Defects (%) ¹			%	Internal Defects (%) ²		Comments
	K	GC	G		HH	VD	
D. R. Norland	0.4	3.6	3.4	7.6	0.0	35.0	Deep eyes, ruptured lenticels,
Red LaSoda	0.6	5.4	2.2	18.9	2.5	40.0	Enlarged lenticels
Sangre	2.9	4.5	4.3	15.9	4.5	27.5	Uniform size
AO92655-9	0.0	1.5	3.2	46.2	0.0	67.5	
AO92657-3	0.2	0.1	0.2	6.1	0.0	37.5	Uniform size, some decay
CO89097-2	1.0	0.9	2.1	3.0	0.0	52.5	Ruptured lenticels, some decay
COO86107-1	0.3	1.3	0.9	12.1	2.5	27.5	
DT6063-1	2.0	2.9	5.1	17.4	10.0	17.5	Some decay
NDO2438-6	1.6	1.3	1.2	31.8	0.0	70.0	Good; smooth skin, some decay
NDO2686-6	0.2	0.6	0.4	16.7	0.0	37.5	Uniform size, nice looking
NDO4300-1	0.4	0.4	2.0	6.1	0.0	47.5	Enlarged lenticels
NDO4323-2	0.5	2.1	0.9	20.4	0.0	57.5	Uniform size, enlarged lenticels
NDO4588-5	0.7	0.5	0.4	18.2	5.0	47.5	Much decay (>30% in one
NDO4592-3	0.9	0.5	1.9	40.1	0.0	45.0	replicate)
NDO5437-7	0.1	0.7	0.4	15.1	0.0	77.5	Uniform size, small, round
Mean	0.8	1.8	1.9	NA	1.8	45.8	
CV (%)	50.6	90.4	61.8	NA	294.8	50.2	
LSD (0.05)	0.6	2.3	1.7	NA	7.7	32.8	

¹ K = Knobs, GC = Growth Cracks, G = Sunburn. Scab, not listed in table (NDO4323-2 0.47%. All other entries 0.00%).

² HH = Hollow Heart, VD = Vascular Discoloration. Figures based on 10 U.S. No 1 tubers per replication. Stem End Browning, not listed in table, (Sangre 2.50% and AO92657-3 5.00%. All other entries 0.00%), Internal Brown Spot, not listed in table (Dark Red Norland, Red LaSoda, AO92655-9 and AO92657-3 2.5%) and Internal Discoloration, not listed in table (AO92655-9 and NDO4588-5 5%, COO86107-4 2.5%).

Oregon Table 7. Yield, Grade, Size Distribution and Specific Gravities of Ten Specialty Varieties and Selections at Corvallis, Oregon, 1998

Entry	Total Yield (cwt/a)	Yield U.S. No. 1 (cwt/a)				Yield (cwt/a)		% U.S. No. 1	Oz/ Tuber ¹	Spec. ² Grav.
		Total	4-6 oz	6-10 oz	>10 oz	<4 oz	2's + Culls			
All Blue	425	151	58	72	21	50	224	35	3.34	1.083
Crispin	430	318	134	159	25	12	100	74	4.60	1.093
Dennis	434	341	66	166	110	14	79	79	5.91	1.084
Germ. Butterball	439	208	110	92	6	52	180	47	3.20	1.086
Red Gold	356	291	89	116	86	12	53	81	5.04	1.087
Yukon Gold	394	330	54	142	133	4	61	85	7.44	1.087
A79543-4	394	255	132	109	14	32	107	65	3.37	1.077
AO90319-1	365	202	52	120	29	24	139	56	4.65	1.082
NDC4069-4 ³	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NDD840-1	354	249	62	107	79	15	92	70	5.31	1.091
Mean	399	260	84	120	56	24	115	66	4.76	1.086
CV (%)	15.3	19.2	21.4	18.8	59.9	18.7	23.3	9.5	13.85	0.461
LSD (0.05)	89.4	73.1	26.3	33.0	49.0	6.5	39.2	9.1	0.96	0.007

¹ Total weight per plot/total number of tubers per plot

² Air/water method

³ Herbicide injury resulting in 100% death of plants.

Oregon Table 8. External and Internal Defects and General Characteristics of Ten Specialty Varieties and Selections at Corvallis, Oregon, 1998

Entry	External Defects (%) ¹			Internal Defects (%) ²			Comments
	K	GC	G	HH	VD	SEB	
All Blue	2.7	0.0	0.0	0.0	0.0	0.0	Dark purple skin and flesh, uneven size
Crispin	1.4	1.0	2.8	0.0	55.0	15.0	Even size, nice looking, yellow flesh
Dennis	0.1	1.1	2.8	0.0	32.5	10.0	Even size, nice looking, pink eyes
German Butterball	0.6	0.2	1.3	0.0	40.0	0.0	Nice looking, skin feathering
Red Gold	0.1	0.7	1.2	0.0	32.5	0.0	Red/yellow; insect damage, sprouts!
Yukon Gold	0.6	1.4	4.0	7.5	10.0	27.5	Nice looking, pink eyes
A79543-4	0.0	0.6	0.2	5.0	2.5	10.0	Round red, nice skin color, deep eyes
AO90319-1	1.9	0.2	0.7	0.0	12.5	0.0	Long russet, even size
NDC4069-4 ³	NA	NA	NA	NA	NA	NA	Metribuzin injury
NDD840-1	1.2	2.5	0.6	5.0	15.0	0.0	Long russet, nice; enlarged lenticels
Mean	1.0	0.9	1.5	1.9	22.2	6.9	
CV (%)	135.07	99.7	92.0	320.7	87.0	162.5	
LSD (0.05)	1.9	1.2	2.0	9.1	28.2	16.5	

¹ K = Knobs, GC = Growth Cracks, G = Sunburn.

² HH = Hollow Heart, VD = Vascular Discoloration, SEB = Stem End Browning. Figures based on 10 U.S. No 1 tubers per replication. Internal Brown Spot, not reported in table (Crispin 2.5%, German Butterball 20%) and Internal Black Spot, not reported in table (Dennis, Yukon Gold and NDD840-1 2.5%, Red Gold 12.5%).

³ Herbicide injury resulting in 100% death of plants.

Oregon Table 9. Yield, Grade, Size Distribution and Specific Gravities of 14 Russet Varieties and Selections at Corvallis, Oregon, 1998

Entry	Total Yield (cwt/a)	Yield U.S. No. 1 (cwt/a)				% Virus	Yield (cwt/a)		% U.S. No. 1	Oz/ Tuber ¹	Spec. Grav. ²
		Total	4-6 oz	6-10 oz	>10 oz		<4 oz	2's + Cull s			
A8495-1	434	307	71	86	149	12.1	11	116	70	5.57	1.092
A8893-1	418	339	53	152	135	NA	34	45	81	6.59	1.089
A88338-1	509	396	35	101	260	0.0	8	105	78	8.15	1.087
A89219-7	397	332	39	114	179	NA	24	41	83	7.17	1.098
AO85165-1	524	423	57	173	189	8.0	15	86	80	6.62	1.086
AO87277-6	632	521	62	216	243	2.3	15	96	82	7.54	1.098
AO88103-3	490	334	106	153	75	3.8	23	132	68	4.69	1.096
AO89128-4	483	279	54	133	91	2.3	22	182	58	5.14	1.096
AO90014-1	373	221	38	93	90	11.4	21	131	59	5.02	1.091
AO90319-1	454	250	59	123	68	0.0	35	169	55	4.70	1.082
AO92007-2	520	331	46	150	135	0.0	27	162	64	5.50	1.089
AO92019-13	532	373	47	163	163	14.4	20	139	70	7.88	1.098
AO92023-3	546	432	56	175	201	0.7	13	100	79	6.74	1.088
AO92173-2	599	420	62	152	206	11.4	28	150	70	6.22	1.081
Mean	493	354	56	142	156	NA	21	118	71	6.25	1.091
CV (%)	13.7	16.3	29.7	30.2	30.7	NA	54.8	25.6	7.8	12.93	0.364
LSD (0.05)	96.7	82.5	23.9	61.4	68.6	NA	16.6	43.3	8.0	1.56	0.006

¹ Total weight per plot/total number of tubers per plot

² Air/water method

Oregon Table 10. External and Internal Tuber Defects and General Characteristics of 14 Russet Varieties and Selections at Corvallis, Oregon, 1998

Entry	External Defects (%) ¹				Internal Defects (%) ²			Comments
	K	GC	G	Scab	HH	VD	SEB	
A8495-1	1.7	0.1	0.3	0.2	22.5	2.5	0.0	Fair to good; deep eyes
A8893-1	1.5	1.2	0.0	0.0	15.0	0.0	2.50	Thick skin, deep eyes
A88338-1	7.1	3.0	0.2	0.7	12.5	5.0	2.5	Uneven size, lenticels
A89219-7	1.0	0.2	1.6	0.0	22.5	0.0	0.0	Nice skin
AO85165-1	1.3	0.6	0.3	0.0	45.0	2.5	2.5	Uneven size, lenticels
AO87277-6	1.4	1.1	1.6	0.0	10.0	5.0	0.0	Uniform, nice; some decay
AO88103-3	1.4	1.2	0.1	0.0	57.5	0.0	0.0	Uneven size, some decay
AO89128-4	4.9	1.4	0.1	0.0	15.0	0.0	0.0	
AO90014-1	1.2	0.4	1.2	0.0	5.0	7.5	5.0	Ugly, enlarged lenticels
AO90319-1	0.9	0.5	0.0	0.0	0.0	0.0	0.0	Yellow fleshed; long, thin
AO92007-2	2.7	0.1	0.0	0.0	30.0	2.5	0.0	Nice
AO92019-13	3.0	0.3	1.6	0.0	55.0	0.0	0.0	Fair to good; some large
AO92023-3	2.1	1.4	1.5	0.1	12.5	2.5	2.5	Deep eyes
AO92173-2	3.7	0.2	1.5	0.0	32.5	0.0	0.0	Uneven size, ugly; some decay
Mean	2.4	0.9	0.7	0.1	23.9	2.0	~ 1.1	
CV (%)	64.0	88.6	108.6	504.7	66.8	171.2	285.2	
LSD (0.05)	2.2	1.2	1.1	0.6	22.9	4.8	4.4	

¹ K = Knobs, GC = Growth Cracks, G = Sunburn.

² HH = Hollow Heart, VD = Vascular Discoloration, SEB = Stem End Browning. Figures based on 10 U.S. No 1 tubers per replication. Internal Black Spot, not reported in table (AO87277-6 5%, AO92019-13 2.5%, AO92023-3 7.5%), Internal Brown Spot, not reported in table (A88338-1, AO89128-4, AO92007-2 2.5%).

Oregon Table 11. Response of 40 Varieties and Selections to Late Blight Infection Under Non-protected (No Fungicides) Conditions at Corvallis, Oregon, 1998

Entry	Foliar Rating ¹	% Tuber Infection ²	Severity Index ³
Russet Burbank	71.2	22.5	6.0
Russet Norkotah	92.5	12.5	2.0
Ranger Russet	62.5	50.0	6.2
Legend	70.0	7.5	3.0
Umatilla	82.5	17.5	5.0
Shepody	81.2	22.5	5.2
A8495-1	86.2	20.0	4.2
A883388-1	46.2	12.5	4.0
AC87084-3	53.7	22.5	5.0
AC88042-1	95.0	15.0	6.0
AC88165-3	81.2	37.5	4.5
AO85165-3	61.2	42.5	4.5
AO87277-6	76.2	10.0	3.2
AO88103-3	80.0	30.0	6.0
AO89128-4	72.5	22.5	6.2
AO90014-1	92.5	5.0	4.7
AO90319-1	71.2	2.5	2.5
CORN-3	75.0	47.5	7.0
CORN-8	76.2	45.0	7.0
TX1385-12	90.0	32.5	6.7
TXNS112	86.2	22.5	7.0
TXNS223	92.5	20.0	4.2
TXNS278	90.0	20.0	5.7
Dk. R. Norland	96.2	12.5	6.7
Red LaSoda	94.5	12.5	5.0
Sangre	77.5	15.0	6.0
AO92657-3	100.0	17.5	7.2
CO89097-2	98.7	25.0	8.0
COO86107-1	100.0	5.0	2.0
DT6063-1	98.7	10.0	6.0
NDO2438-6	100.0	5.0	2.0
NDO2686-6	100.0	0.0	0.0
NDO4300-1	100.0	10.0	4.5
NDO4588-5	97.5	5.0	2.2
NDO4592-3	100.0	12.5	4.7
Atlantic	92.5	0.0	0.0
Avalanche	70.0	20.0	6.7
Chipeta	60.0	37.5	6.7
A88431-1	52.5	47.5	7.2
AC87340-2	75.0	25.0	7.2
Mean	82.6	20.0	5.0
CV (%)	15.4	67.3	59.7
LSD (0.05)	17.8	18.8	4.2

¹ Percent leaf surface infected with late blight (0 = 0%, 50 = 50%, 100 = 100% leaf surface dead).

² Percent of tubers showing late blight infection based on 10 randomly selected tubers per plot.

³ Decay severity rating (includes secondary infection): 1 = minor decay, 5 = moderate decay, 10 = severe decay).

Pennsylvania

B. J. Christ, M.W. Peck, and T.A. Young

The potato evaluation trial was conducted at the Russell E. Larson Agricultural Research Center in Rock Springs, PA. This trial is part of an extensive and on-going project that evaluates promising clones for yield and chip processing potential. Clones that are identified as excellent performers are then evaluated in regional trials across Pennsylvania.

Materials and Methods

The trial was planted on May 19 as single row plots in a randomized complete block design with three replications. Plots were 10 ft long, 36 in between rows, 8 in between seed pieces, and 5 ft breaks between treatments within the rows. Fertilization was banded in furrow during planting at a rate of 906 lbs/A of 5-10-20 (N-P-K). The plots received 0.4 in of irrigation on August 5. The plots were vine killed on September 4 and 11. The tubers were harvested September 21 through 30.

Specific gravity was determined by the weight-in-air/weight-in-water method. Tubers were held at ambient temperature until they were placed in storage. The tubers chipped prior to January were held in a 55°F storage and those chipped after December were held at 45°F and then chipped at 45°F or reconditioned at 55°F for three or six weeks prior chipping. Samples were chipped five times throughout the winter. Four tubers from each clone were peeled, cut in half, and sliced. Eight center slices from each half were cut and fried at 365°F. The chip samples were rated on a scale of 1-10 according to a modified snack food color chart.

Results

For the first six weeks of the growing season there was adequate moisture, but throughout the remainder of the season there was below normal rainfall.

There were numerous lines with yield greater than Atlantic or Snowden. However, of those lines only a few had consistently light chip color. The following lines produced light chips regardless of storage temperature: Snowden, E11-45, NY101, NY103, NY112, NY115, NY120, NY119, R17-2, AF1668-60, AF1856-1, B0178-

34, B0564-8, B0766-3, B1240-1, B1415-7, B1440-18, B1598-4, S14-2, S32-2, S300-1, S300-7, S300-9, ND2676-10, AF1898-2, AF1899-1, B1624-22, and S300-13. The following lines chipped directly out of 45°F storage: Snowden, B0766-3, NY115, R17-2, S300-7 and ND2676-10. All of the above lines except for NY119, R17-2, S300-7, S300-9, S300-13, AF1899-1 and AF1898-2 had adequate to excellent yields during the 1998 growing season. The lines with the highest specific gravity were: B0178-34, B0766-3, B1240-1, B1415-7, S32-2, S300-9, AF1898-2, AF1899-1 and S300-13.

Those lines with nice appearance and high yield that would perform well as a round white table-stock line are: E11-45, NY101, NY103, NY110, AF1437-1, and AF1763-2. Red-skinned table-stock lines with high yield were: ND5084-3R, B1758-3, NY118, B0984-1 and B1491-5. ND4093-4 was a high yielding russet-skinned line with good fry color. Another russet with excellent fry color was B1409-2.

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Pennsylvania Table 1. Total and >2" yield, percentage >2", specific gravity, and chip color results from potato evaluation trial in Centre County, Pennsylvania.

Cultivar	Yield (cwt/A)			Specific gravity	Chip Color				
	Total	>2"	%>2"		Nov ¹	Dec ²	Jan ³	Feb ⁴	Feb ⁵
Whites									
Atlantic	549	485	89	1.092	4	3	4	4	6
Katahdin	518	468	92	1.073	-	-	-	-	-
Snowden	422	384	91	1.087	3	3	3	3	3
Superior	472	436	92	1.078	4	4	6	6	8
AF1437-1	572	525	92	1.063	5	4	7	8	9
AF1565-12	423	373	88	1.072	6	6	8	8	9
AF1612-8	450	398	89	1.073	4	5	7	7	8
AF1615-1	378	348	91	1.081	3	4	7	7	7
AF1668-60	439	415	94	1.084	3	3	4	3	5
AF1668-62	386	340	88	1.085	3	3	5	4	5
AF1753-12	424	349	83	1.074	6	5	8	8	8
AF1758-5	553	510	92	1.072	4	4	6	7	7
AF1758-7	377	350	92	1.065	6	5	7	7	8
AF1763-2	512	450	88	1.066	6	6	9	9	10
AF1764-9	527	478	91	1.081	5	5	7	7	8
AF1775-2	580	542	93	1.090	4	4	6	6	7
AF1856-1	467	435	93	1.081	4	3	5	4	7
AF1857-2	511	456	89	1.090	4	3	6	6	8
AF1896-2	428	358	83	1.086	4	3	5	5	7
AF1896-5	384	342	89	1.089	4	3	6	5	8
AF1897-2	481	390	81	1.080	4	3	6	7	6
AF1921-5	404	385	95	1.073	4	4	8	9	9
AF1935-6	602	554	92	1.088	4	4	6	6	6
AF1956-1	499	445	89	1.094	3	3	5	5	5
W94-4311-3	509	402	79	1.091	4	5	6	5	6
B0178-34	579	545	94	1.096	4	3	5	4	6
B0564-8	519	425	92	1.085	3	3	5	5	6
B0564-9	507	443	87	1.081	4	4	6	6	7
B0776-3	550	503	92	1.090	3	3	3	3	3
B1065-51	388	359	92	1.073	6	6	7	8	10
B1066-73	643	490	79	1.089	5	4	6	6	7
B1083-51	460	431	94	1.084	3	4	6	6	8
B1240-1	570	496	87	1.086	3	3	4	4	7
B1248-5	527	450	85	1.080	4	5	8	8	8
B1414-6	431	390	91	1.082	4	4	6	4	7
B1415-7	447	413	87	1.086	3	3	5	4	5
B1425-9 §	576	517	90	1.093	4	4	7	5	6
B1429A-3	529	481	91	1.081	4	3	6	5	7
B1440-18	567	513	90	1.077	3	3	6	3	5
B1450-10	613	382	62	1.084	5	5	7	7	8
B1452-21	373	294	79	1.076	5	4	7	7	8
B1591-1	499	460	92	1.095	4	4	6	5	7
B1598-4	477	432	90	1.072	3	3	4	4	7
B1625-8	461	382	83	1.081	4	4	5	4	6
B1709-6	436	386	89	1.085	3	3	5	4	6
B1752-5 §	425	344	80	1.076	5	4	7	7	8
Reba	529	463	88	1.078	3	3	5	5	6
E11-45	548	476	87	1.070	3	3	4	3	6
NY101 §	651	577	89	1.079	4	4	5	6	7
NY103	573	536	94	1.078	3	3	4	5	6
NY110	509	492	96	1.078	3	3	5	5	6
NY112	654	583	89	1.084	3	3	3	3	5
NY115	446	417	94	1.077	3	3	3	3	4
NY119	481	408	84	1.094	3	3	5	3	4
NY120	523	454	87	1.084	3	3	3	3	6
NY121	429	325	76	1.080	4	3	6	6	7

Pennsylvania Table 1. Continued.

Cultivar	Yield (cwt/A)			Specific gravity	Chip Color				
	Total	>2"	%>2"		Nov ¹	Dec ²	Jan ³	Feb ⁴	Feb ⁵
NY122	521	462	88	1.078	4	4	6	5	5
R17-2	384	364	95	1.076	3	3	3	3	3
R17-7	667	594	89	1.076	3	4	7	6	8
R17-11	447	393	88	1.071	3	3	5	5	6
R17-19	492	471	95	1.073	4	4	6	7	8
R17-106	582	482	83	1.075	4	3	6	6	7
R41-11	578	526	91	1.071	3	3	6	5	7
S3-1	351	307	87	1.072	3	3	6	5	7
S4-3	463	413	89	1.078	5	5	7	7	8
S14-2	505	446	89	1.084	3	4	4	3	5
S26-2 §	465	406	87	1.078	4	4	4	4	5
S27-2 §	548	505	93	1.078	4	4	6	6	7
S31-1	730	619	84	1.071	4	3	5	5	6
S31-3	626	577	92	1.067	6	6	7	8	8
S31-7 §	435	390	90	1.076	4	4	6	4	7
S32-2	509	469	92	1.089	3	3	4	4	6
S33-5	463	400	86	1.080	3	3	5	4	6
S34-3	437	415	95	1.080	3	4	5	5	6
S106-17	451	379	84	1.081	3	4	8	7	9
S300-1	477	401	84	1.081	3	3	4	4	4
S300-7	397	354	88	1.081	3	3	3	3	3
S300-9	421	392	92	1.092	3	3	3	3	5
ND2676-10	506	429	85	1.083	3	3	3	3	4
LSD (P=0.05)	113	108	17.6	(LSD values were culcated using White & International Data)					
Reds									
D.R Norland	383	334	87	1.065	-	-	-	-	-
Chieftain	529	453	85	1.075	-	-	-	-	-
S.R. Norland	398	355	89	1.058	-	-	-	-	-
B0811-4 §	359	260	72	1.086	-	-	-	-	-
B0852-7	531	446	84	1.080	-	-	-	-	-
B0967-11	635	533	84	1.085	-	-	-	-	-
B0984-1	524	428	82	1.086	-	-	-	-	-
B1102-3	348	231	66	1.079	-	-	-	-	-
B1145-2	375	276	75	1.067	-	-	-	-	-
B1491-5	492	416	85	1.081	-	-	-	-	-
B1492-12	527	374	65	1.082	-	-	-	-	-
B1493-3 §	397	327	82	1.086	-	-	-	-	-
B1758-3	536	462	86	1.081	-	-	-	-	-
ND2225-1R	367	280	76	1.067	-	-	-	-	-
ND5084-3R	543	469	86	1.068	-	-	-	-	-
NY97	537	472	88	1.077	-	-	-	-	-
NY118	517	435	84	1.071					
LSD (P=0.05)	151	140	9.3						
International									
Amdeus	555	491	89	1.086	-	-	-	-	-
Caesar	581	498	86	1.086	5	4	-	-	-
Latona	587	492	83	1.085	4	5	-	-	-
Morning Gold §	620	528	85	1.078	5	5	-	-	-
Obelix	579	462	80	1.070	5	6	-	-	-
Symfonia	430	329	77	1.097	-	-	-	-	-
LSD (P=0.05)	113	108	17.6	(LSD values were calculated using White & International Data)					
Non- Rep Whites									
Carola §	518	401	77	1.081	6	5	0	0	0
Saginaw §	423	336	79	1.084	4	4	0	0	0
AF1771-2	502	355	71	1.081	4	4	7	6	8
AF1898-2	408	374	92	1.089	5	4	3	3	4
AF1899-1	460	333	72	1.100	3	3	4	3	7
AF1907-6	517	413	80	1.067	5	5	7	7	7

Pennsylvania Table 1. Continued.

Cultivar	Yield (cwt/A)			Specific gravity	Chip Color				
	Total	>2"	%>2"		Nov ¹	Dec ²	Jan ³	Feb ⁴	Feb ⁵
AF1925-1	361	303	84	1.088	4	4	7	6	7
AF1949-1	521	474	91	1.088	5	4	7	6	6
AF1951-1	463	404	87	1.088	3	3	6	6	7
W94-4301-5	376	317	84	1.083	3	4	7	5	6
B1624-22	516	460	89	1.075	3	3	5	3	5
B1711-8	467	437	94	1.086	3	4	7	6	7
S4-2	564	508	90	1.076	4	5	8	7	8
S28-2 §	559	454	81	1.086	4	4	7	5	7
S32-3	577	517	90	1.087	3	4	4	5	6
S300-13	417	357	86	1.087	3	3	4	4	5
Elba	517	468	91	1.082					
Non-Rep Reds, Blues, & Purples									
All Blue	494	340	70	1.088	-	-	-	-	-
Blue Mac	568	435	77	1.097	-	-	-	-	-
Cherry Red	397	367	92	1.083	-	-	-	-	-
B1493-1	323	194	59	1.087	-	-	-	-	-
B1495-6	356	241	68	1.086	-	-	-	-	-
B1495-15	424	386	91	1.081	-	-	-	-	-
Misc									
BD113-3 +	95	1	2	1.105	-	-	-	-	-
BD132-2 §	138	30	22	1.094	-	-	-	-	-
BD146-4 §	142	6	4	1.040	-	-	-	-	-

Pennsylvania Table 2. Total, marketable, % marketable, specific gravity, and chip color results from potato evaluation trial in Centre County, Pennsylvania.

Cultivar	Yield (cwt/A)			Specific gravity	Chip Color				
	Total	Mkt	%>Mkt ⁶		Nov ¹	Dec ²	Jan ³	Feb ⁴	Feb ⁵
Russet and Long Whites									
Rus Norkotah	392	214	55	1.074	-	-	-	-	-
AF1776-2	586	504	86	1.084	-	-	-	-	-
AF1864-6	536	473	88	1.071	-	-	-	-	-
B1409-2	328	190	57	1.094	-	-	-	-	-
B1463-1	365	221	60	1.082	-	-	-	-	-
B9922-11	253	130	55	1.093	-	-	-	-	-
ND4093-4 Rus	482	283	60	1.079	-	-	-	-	-
LSD (P=0.05)	97	66	18						

¹ Nov. = Stored at 55° F from November 2, 1998 and chipped on November 16, 1998.

² Dec. = Stored at 55° F from November 2, 1998 and chipped on December 18, 1998.

³ Jan. = Stored at 45° F from November 10, 1998 then transferred to 55° F three weeks prior to chipping on January 27, 1999.

⁴ Feb. = Stored at 45° F from November 10, 1998 then transferred to 55° F six weeks prior to chipping on February 16, 1999.

⁵ Feb. = Stored at 45° F from November 10, 1998 and chipped on Feb 9, 1999.

⁶ Percentage of total yield

+ = Orange Flesh

§ = Yellow Flesh

Chip color is based on a 1-10 scale with 1 = lightest, 10 = darkest, 1-5 = acceptable chip color.

November through February chipping performed at P.S.U.

Texas

J. Creighton Miller, Jr., Douglas C. Scheuring and
Jeff W. Koym

Variety Development Testing

Seedling program. In 1998, 100,740 first year seedlings, resulting from 546 different parental combinations or families (crosses), were grown for selection on the Barrett Farm near Springlake. Three hundred nine selections were made from this material. The seedlings grown for selection in 1998 represent a substantial increase from the number grown in 1997. The 1998 first year seedlings from Texas (16,096) were grown during the fall of 1997 at College Station. The remainder was obtained from Joe Pavsek in Idaho (13,825), David Holm in Colorado (10,664), Kathy Haynes in Beltsville, Maryland (5,734), Al Mosley in Oregon (33,408), Rich Novy in North Dakota (20,006), and Bob Hanneman USDA-ARS, Madison, Wisconsin (1,007).

Since the inception of the Texas Variety Development Program in 1973, 1,066,452 seedlings have been grown for selection in Texas, from which 5,870 original selections have been made.

Adaptation trials. The 1998 growing season was marked by below normal maximum temperatures in April and May followed by above average maximum temperatures in June and July. Below average precipitation was experienced throughout the entire season. Vine growth was significantly above average. In general, the Texas Russet Norkotah strain selections continued to out-perform standard Russet Norkotah. The variety and advanced selection trials at Springlake were planted on March 24 (russets) and March 29 (reds) and harvested on August 3 (reds) and August 9 (russets).

Fifteen russet advanced selections and the varieties Century Russet, Norgold Russet M, Russet Norkotah, and Russet Legend were tested for their adaptability to Texas High Plains conditions (Table 1). Century Russet significantly and substantially out-yielded all other entries with a total yield of 613 cwt/A. All of the entries, with the possible exception of Russet Legend and ATX9332-5, produced satisfactory yields. Those entries receiving high general ratings included AO85165-1, A79180-10Ru, ATX84706-2Ru, TX1229-2Ru, and ATX82539-4Ru.

The red trial consisted of 10 varieties or advanced selections (Table 2). The outstanding entries based on yield were Red LaSoda, NDC4438-1, A82705-1R (IdaRose), and NDTX731-1R. Red LaSoda and NDTX731-1R tend to produce large tubers if vines

are not killed in a timely manner. NDTX731-1R bulks very fast but has a relatively low number of tubers per plant. All of the entries received satisfactory general ratings.

The yellow flesh trial included 14 entries with Yukon Gold as the check (Table 3). Yukon Gold was the outstanding entry based on yield. Others entries producing moderate yields of U.S. No 1's included Diamant, Penta, TX1523Ru/Y, Irish Crispin, BTX1544-2Y, Vokal, TX1574-1Y, and Hertha. Bintje, Alpha, and Agria produced unsatisfactory yields. Those receiving high general ratings included Yukon Gold, TX1523Ru/Y, BTX1544-2Y, and TX1574-1Y. Diamant had a noticeably high percentage of culls.

The Russet strip trial consisted of 11 entries including the check varieties Century Russet, Norgold Russet M, and Russet Norkotah for which sufficient seed was available for strip planting 100 foot rows (Table 4). Strip trials more closely duplicate grower conditions and represent a more advanced phase of testing than replicated variety trials. Four randomly selected plots of each entry were harvested. Again, Century Russet substantially and significantly out-yielded all other entries with a total yield of 573 cwt/A. TXNS112 was the outstanding Russet Norkotah strain entry in this trial followed by TXNS278, CORN-8, and TXNS223. The performance of CORN-3 was disappointing. The performance of standard Russet Norkotah, while still inferior relative to the strains, was far better than in previous years. This can probably be attributed to the excellent vine growth during the 1998 season. The average tuber weight for all Russet Norkotah strains was higher than that for standard Russet Norkotah. Russet Legend does not appear to be adapted to Texas

Five advanced selections and the check variety Red LaSoda were also grown in a strip trial for evaluation (Table 5). NDTX731-1R and Red LaSoda were the highest yielding entries. DT6063-1R, NDO2438-6R, and COO86107-1R produced satisfactory yields. A82705-1R (IdaRose) was the lowest yielding entry. Highest general rating scores were received by NDTX731-1R, Red LaSoda, and COO86107-1R. DT6063-1R produced noticeably more culls than did the other entries. A82705-1R (IdaRose) was very late maturing, which may eliminate it as a red variety for Texas.

Twenty-nine selections, which were selected between 1986 and 1995 and three check varieties were also evaluated for yield and quality (Table 6). Red LaSoda, Russet Norkotah, and Atlantic were included as check varieties. Many of the entries produced yields equal to or superior to the check varieties.

Most of the selections were grown from Texas seed which was virus contaminated. Entries receiving high general rating scores included NDTX5522-2W, ATX91137-1Ru, BTX1749-2Ru, COTX93068-1R, ATX82539-4Ru, BTX1754-1W, ATX9202-3Ru, NDTX4930-5W, COTX90046-5Ru, NDTX5407-1R, ATX9302-1Ru, NDTX4828-2R, ATX9332-8Ru, NDTX5438-11Ru, ATX9332-1Ru, COTX93032-1R, and NDT4304-1R.

Texas Table 1. Total yield, yield of U.S. No.1, average tuber weight, specific gravity, tuber type, skin type, and general rating of 15 russet potato advanced selections or varieties grown at Springlake, Texas-1998.

Variety or Selection	Total Yield Cwt/A	Total Yield oz	Average		Specific Gravity	Tuber Type	Skin Type	General Rating ¹
			U.S. No.1 Cwt/A	Tuber Weight in oz.				
Century Russet	612.6	521.9	187.0	7.4	1.068	Long	Russet	3.3
A84180-8	460.8	392.6	115.7	6.1	1.081	Long	Russet	3.0
Norgold-M	423.5	302.3	32.5	5.1	1.057	Oblong	Russet	3.3
Russet Norkotah	420.9	308.0	46.4	5.0	1.086	Oblong	Russet	3.3
A085165-1	402.0	295.3	59.8	4.9	1.082	Oblong	Russet	3.7
A79180-10Ru	382.3	354.3	60.7	6.5	1.095	Oblong	Russet	3.7
TXAV657-27Ru	377.1	327.7	46.8	5.4	1.073	Oblong	Russet	3.3
ATX84706-2Ru	372.9	360.5	116.0	12.8	1.095	Oblong	Russet	4.0
ATX9371-3Ru	356.5	255.0	52.3	4.7	1.091	Long	Russet	3.3
COO83008-1Ru	339.5	310.0	33.1	5.8	1.085	Oblong	Russet	3.3
TX1229-2Ru	338.8	324.1	91.3	11.9	1.083	Oblong	Russet	3.7
ATX9342-4Ru	322.2	255.3	79.4	6.3	1.093	Long	Russet	3.3
ATX82539-4Ru	320.6	288.1	88.9	7.6	1.078	Long	Russet	3.7
Russet Legend	277.3	226.9	29.6	5.7	1.084	Oblong	Russet	3.3
ATX9332-5	175.1	121.6	0.0	3.8	1.081	Oblong	Russet	3.0
Average	372.1	309.6	69.3	6.6	1.082			3.4
L.S.D. (.05)	110.9	90.8	31.4	2.3				

¹ 1 = very poor to 5 = excellent

Texas Table 2. Total yield, yield of U.S. No.1, average tuber weight, specific gravity, tuber type, skin type, and general rating of 10 red potato advanced selections or varieties grown at Springlake, Texas-1998.

Variety or Selection	Total Yield Cwt/A	U.S. No.1 Total Yield	Cwt/A 10-18	Average Tuber		Specific Gravity	Tuber Type	Skin Type	General Rating ¹
				oz	Weight in oz.				
Red LaSoda	553.4	465.6	61.7		4.7	1.053	Oblong	Red	3.7
NDC4438-1	369.7	174.0	0.0		2.5	1.057	Oblong	Red	3.8
A82705-1R (IdaRose)	305.2	155.3	0.0		2.7	1.043	Oblong	Red	3.7
NDTX731-1R	283.1	235.7	62.1		5.1	1.050	Round	Red	3.7
COTX93075-5R	220.6	37.3	0.0		1.8	1.057	Round	Red	3.2
CO86218-2	208.5	69.9	0.0		2.2	1.040	Oblong	Red	3.3
NorDonna	170.1	77.7	0.0		2.7	1.057	Round	Red	3.5
NDTX5853-1Pu	166.6	53.2	2.7		2.7	1.052	Round	Red	3.7
Sangre-10	130.5	74.6	8.5		3.1	1.039	Oblong	Red	3.7
ND5084-3R	49.7	26.4	0.0		2.6	1.042	Oblong	Red	3.3
Average	245.7	137.0	13.5		3.0	1.049			3.6
L.S.D. (.05)	70.8	61.3	ns		0.8				

¹ 1= very poor to 5= excellent

Texas Table 3. Total yield, yield of U.S. No. 1, average tuber weight, specific gravity, tuber type, skin type, and general rating of 14 yellow flesh potato advanced selections or varieties grown at Springlake, Texas-1998.

Variety or Selection	Total Yield Cwt/A	U.S. No. 1 Total Yield	Cwt/A 10-18 oz	Average			Specific Gravity	Tuber Type	Skin Type	General Rating ¹
				Tuber Weight in oz.	Tuber					
Yukon Gold	351.1	322.1	98.6	6.0	Oblong	White/Y	1.066	Oblong	White/Y	4.0
Diamant	317.4	159.0	19.2	3.6	Oblong	White/Y	1.063	Oblong	White/Y	2.0
Penta	281.2	215.7	10.1	4.1	Round	White/Y	1.062	Round	White/Y	3.1
TX1523Ru/Y	265.9	242.3	56.2	6.5	Round	Russet/Y	1.064	Round	Russet/Y	3.8
Irish Crispin	254.5	191.1	0.0	4.0	Round	White/Y	1.057	Round	White/Y	3.1
BTX1544-2Y	236.1	200.4	52.8	5.5	Oblong	White/Y	1.062	Oblong	White/Y	3.7
Vokal	233.8	171.7	14.5	3.8	Oblong	White/Y	1.059	Oblong	White/Y	3.0
TX1574-1Y	206.6	179.9	47.6	6.4	Oblong	White/Y	1.067	Oblong	White/Y	3.4
Hertha	205.0	168.0	21.0	4.5	Oblong	White/Y	1.067	Oblong	White/Y	3.1
Sante	193.7	125.8	5.7	3.4	Oblong	White/Y	1.066	Oblong	White/Y	2.4
Aziza	187.2	108.5	4.1	3.0	Oblong	White/Y	1.062	Oblong	White/Y	2.2
Bintje	174.8	51.0	4.9	2.2	Oblong	White/Y	1.057	Oblong	White/Y	1.8
Alpha	128.7	54.9	1.8	3.9	Oblong	White/Y	1.069	Oblong	White/Y	1.7
Agria	118.8	93.2	18.6	3.8	Oblong	White/Y	1.057	Oblong	White/Y	2.7
Average	225.3	163.1	25.4	4.3			1.063			2.9
L.S.D. (.05)	88.4	63.3	18.3	1.1						

1= very poor to 5= excellent

¹ 1 = very poor to 5 = excellent

Texas Table 4. Total yield, yield of U.S. No. 1, average tuber weight, specific gravity, tuber type, skin type, and general rating of 11 russet potato advanced selections or varieties grown at Springlake, Texas-1998.

Variety or Selection	Total Yield Cwt/A	U.S. No. 1 Total Yield	Cwt/A 10-18 oz	Average		Specific Gravity	Tuber Type	Skin Type	General Rating ¹
				Tuber Weight in oz.	Tuber Weight in oz.				
Century	572.6	448.5	156.3	8.2	8.2	1.045	Long	Russet	3.7
TXNS112	403.5	309.3	88.3	7.2	7.2	1.057	Oblong	Russet	4.0
Norgold-M	360.8	276.1	79.0	6.0	6.0	1.057	Oblong	Russet	3.3
TX1385-12Ru	341.4	240.4	62.3	6.3	6.3	1.057	Oblong	Russet	3.7
TXNS278	339.8	281.2	58.6	6.2	6.2	1.058	Oblong	Russet	4.3
CORN-8	327.2	249.7	69.5	6.5	6.5	1.055	Oblong	Russet	4.0
TXNS223	311.1	234.4	56.1	5.7	5.7	1.047	Oblong	Russet	3.7
Russet Norkotah	290.1	243.7	45.0	5.2	5.2	1.054	Oblong	Russet	3.7
CORN-3	276.9	216.9	61.7	6.6	6.6	1.056	Oblong	Russet	4.0
TXAV657-27Ru	254.6	231.7	73.0	7.1	7.1	1.069	Oblong	Russet	4.0
Russet Legend	206.2	161.4	30.3	5.4	5.4	1.060	Oblong	Russet	2.7
Average	334.9	263.0	70.9	6.4	6.4	1.056			3.7
L.S.D. (.05)	85.2	65.1	35.7	1.0	1.0				

¹ 1 = very poor to 5 = excellent

Texas Table 5. Total yield, yield of U.S. No.1, average tuber weight, specific gravity, tuber type, skin type, and general rating of 6 red potato advanced selections or varieties grown at Springlake, Texas-1998.

Variety or Selection	Total Yield Cwt/A	U.S. No.1		Average Tuber Weight in oz.	Specific Gravity	Tuber Type	Skin Type	General Rating ¹
		Total Yield	Cwt/A. 10-18 oz					
NDTX731-1R	460.6	412.0	99.2	5.6	1.053	Oblong	Red	4.3
Red LaSoda	400.2	370.1	92.2	6.2	1.057	Oblong	Red	4.0
DT6063-1R	368.3	301.7	55.7	4.6	1.066	Oblong	Red	3.5
NDO2438-6R	328.3	287.0	30.3	4.6	1.051	Oblong	Red	3.3
COO86107-1R	328.2	291.3	50.1	5.0	1.064	Oblong	Red	4.0
A82705-1R (IdaRose)	272.0	206.0	12.2	3.6	1.049	Oblong	Red	3.3
Average	359.6	311.4	56.6	4.9	1.057			3.7
L.S.D. (.05)	105.5	91.6	49.1	0.9				

¹ 1 = very poor to 5 = excellent

Texas Table 6. Total yield, yield of U.S. No. 1, average tuber weight, specific gravity, tuber type, skin type, and general rating of 29 advanced selections and three check varieties grown at Springlake, Texas-1997.

Variety or Selection	Total Yield Cwt/A	U.S. No. 1		Average Tuber Weight in oz.	Specific Gravity	Tuber Type	Skin Type	General Rating ¹
		Total Yield	Cwt/A 10-18 oz					
NDTX5522-2W	471.4	389.2	80.8	5.9	1.068	Oblong	White	3.9
ATX91137-1Ru	451.1	383.9	118.6	6.4	1.063	Oblong	Russet	4.1
BTX1749-2Ru	436.2	378.3	74.8	5.1	1.073	Oblong	White	3.8
COTX93068-1R	377.0	216.6	3.5	3.6	1.054	Oblong	Red	4.0
ATX82539-4Ru	358.9	318.1	99.7	7.7	1.062	Oblong	Russet	4.2
Red LaSoda	357.6	318.9	110.9	7.0	1.060	Oblong	Red	4.0
BTX1754-1W	352.3	287.4	68.0	5.6	1.076	Oblong	White	4.1
ATX9202-3Ru	352.1	283.8	34.1	5.0	1.073	Oblong	Russet	3.7
NDTX4930-5W	348.2	311.1	75.8	6.3	1.069	Oblong	White	3.5
COTX93054-4R	344.7	197.4	13.2	2.8	1.066	Oblong	Red	3.4
COTX90046-5Ru	331.5	290.7	83.1	5.9	1.077	Oblong	White	4.0
NDTX5407-1R	328.2	201.1	11.7	3.2	1.062	Oblong	Red	3.8
ATX9302-1Ru	321.8	274.5	72.2	6.6	1.080	Oblong	Russet	3.9
COTX93075-5R	314.1	221.7	5.4	3.1	1.063	Oblong	Red	3.0
Russet Norkotah	313.7	231.6	84.3	7.4	1.065	Oblong	Russet	3.7
NDTX4828-2R	313.2	251.1	23.1	4.4	1.065	Oblong	Red	3.7
Atlantic	304.8	248.1	43.5	4.3	1.081	Round	Russet	3.8
ATX9371-3Ru	304.2	235.8	47.1	5.2	1.065	Long	Russet	3.0
BTX1749-1Ru	299.5	220.7	38.3	4.4	1.073	Oblong	Russet	3.3
ATX9332-13Ru	283.6	264.4	78.5	8.4	1.063	Oblong	Russet	3.4
ATX90480-4W	274.1	223.5	45.0	5.0	1.069	Oblong	Russet	3.3
ATX9332-8Ru	264.8	226.6	75.1	6.7	1.080	Long	Russet	3.8
NDTX5438-11R	264.6	161.6	1.7	3.2	1.061	Oblong	Red	3.7
ATX9342-4Ru	258.6	209.2	52.1	6.2	1.082	Long	Russet	2.8
ATX9332-12Ru	250.3	182.8	15.5	4.6	1.081	Oblong	Russet	2.8
ATX9332-1Ru	246.9	210.1	45.3	6.5	1.073	Round	Russet	3.7
NDTX5067-2R	236.8	151.3	7.3	3.4	1.063	Round	Red	3.3
COTX93032-1R	218.5	155.3	11.3	3.5	1.074	Oblong	Red	3.7
NDTX4304-1R	184.4	144.8	52.9	4.8	1.050	Oblong	Red	3.8
COTX90046-1W	182.2	153.3	55.1	5.5	1.070	Oblong	White	3.0
ATX9332-5Ru	167.0	137.8	7.6	4.5	1.071	Oblong	Russet	2.7
NDTX4271-5R	123.8	102.7	20.8	4.6	1.057	Oblong	Red	2.7
Average	301.	237.0	48.6	5.2				3.5
L.S.D. (.05)	114.	97.0	36.9	1.0				

¹ 1 = very poor to 5 = excellent

Virginia

S.B. Sterrett and C.P. Savage, Jr.

Introduction

Trials were conducted at the Eastern Shore Agricultural Research and Extension Center in Painter, Virginia. Promising clones were evaluated for yield, tuber quality and appearance, vine and tuber maturity, processing (chip) potential and freedom from internal and external tuber defects. To address potential marketing niches, red-skinned and russeted clones were also evaluated for suitability in this growing area.

Methods

All trials were planted on a Bojac sandy loam soil. Germplasm evaluation trials were planted on March 31 in single row plots 25 feet in length with 3 feet between rows, 12 inches within row spacing for all except the red trial that was planted at 8 inches. Transgenic evaluation trials were planted on April 9 in single row plots 35 feet in length, 12 inches between seedpieces. Trials were planted using a randomized complete block design with 4 replications except the transgenic trial, which had 8 replications. Fertilizer (100 lbs. N, 43.7 lbs. P, and 83 lbs. K/A) was banded at planting with carbofuran (3 lb. ai/A) banded in the furrow for Colorado potato beetle control. Nitrogen (50 lbs./A) was sidedressed on May 19. Herbicide (1.33 lb ai/A metolachlor, 0.5 lb ai/A linuron and 0.15 lb ai/A metribuzin) was applied at dragoff on April 21. All plots were sidedressed with 50 N/A (UAN) on May 19. No irrigation was applied this year. Round-white trials were harvested July 6, russet and red-skinned trials on July 7. Specific gravity was determined by weight in air/weight in water method for all trials. Chip samples were held at ambient temperature and chipped 2 days after harvest. The transgenic study was planted to examine earliness in maturity and horticultural characteristics of selected Atlantic clones. A randomized complete block design was used with 8 replications. Plots were harvested on July 1, 15 and 29.

Results

Round-white Trial. Marketable yield of several entries was significantly higher than Superior.

Exceptional tuber appearance and freedom from external defects were also noted for B0564-9 and B1435-15. Although yield of AF1791-1 and AF1845-6 were among the highest in this trial, somewhat flat, rough and irregular tubers appearance may limit the fresh-market potential of these entries. The most severe second growth was noted for AF1758-7, with less severe defects found in AF 1758-71, B1452-18, NYR17-7 and NYR17-106.

Chip Trial. Marketable yield of AF1753-12, AF1857-2 and B1425-9 were significantly lower than Atlantic. External defects were minimal in this trial. Additional evaluation of NY119 may be warranted because of high yield potential, specific gravity equal to Atlantic and exceptional chip color. However, susceptibility to internal heat necrosis (IHN) may be a problem for that entry.

Commercial Trial. Significantly higher marketable yield was recorded for Adora than Superior while that of Caesar, Provento, Victoria and Yukon Gold was significantly lower. High temperature preceding harvest may have adversely affected yellow flesh color as most entries were pale compared to previous years. External defects were a serious concern for Provento, Victoria (second growth), and Cosmos (growth cracks). Susceptibility of Cosmos, Provento, and Victoria to IHN similar to that of Atlantic suggests that these entries may not be adapted to the growing conditions in this area.

Red/Purple-skinned Trial. Marketable yield of several entries exceed that of Dark Red Norland. Of these, Chieftain, Red LaSoda, and Rideaux were more pink than red in skin color, thereby limiting their market potential. Susceptibility to rot was a concern for Dark Red Norland, Cherry Red, B1145-2 and B1493-2. Entries with high yield, bright skin color, and a high percentage of tubers less than 1 7/8" in diameter included NorDonna and B1492-12. Skin color of B0852-7 is bright purple and with acceptable total and marketable yield. The greater percentage of tubers in the large (>2.5") size category and late skin maturity (tubers easily skinned) suggest that adjustments in cultural management may be needed for this entry to be commercially acceptable.

Russetted-skinned Trial. Yield of all entries were similar to that of Russet Norkotah. Innovator and B0835-11 had the greatest percentage of tubers >8 oz. at 17 and 24%, respectively. However, these may be too low to make count-box marketing economically feasible. Of the two Russet Norkotah selections (#3 and #8), #8 had appreciably greater marketable yield and more attractive tubers than the Russet Norkotah standard. Norkotah #3 had heavier russetting, and more irregular tuber appearance.

Transgenic Trial. The highest early vigor rating was recorded for ATBT04-36 with the lowest for the non-transgenic standard. However, vine size of the standard Atlantic was largest at harvest, with the smallest for ATBT04-36.

Total yield of ATBT04-06 was significantly greater than the standard, but there was no significant difference between entries in marketable yield. Marketable average tuber weight of ATBT04-31 was significantly larger than either ATBT04-06 or -36. The large tuber set (rating) noted for ATBT04-36 suggested a greater number of undersized tubers as reflected in the significantly lower average marketable tuber weight compared to either -31 or the standard

Both total and marketable yield increased from the early to the main season harvest, but decreased by late July. July was quite hot and relatively dry (2.5"; 58 year average=4.5"). Because of concerns for tuber rot, plots were not irrigated after harvesting began on July 1. However, there was appreciable loss to rot by the third harvest in all reps for all entries. Commercial growers experienced similar problems in the latter part of the commercial harvest period. The most attractive tubers were found in ATBT04-06; the standard received the lowest rating. The non-transgenic Atlantic used in this study seemed to be rougher and more irregular than Atlantic obtained from other commercial sources. Skin maturity improved with each successive harvest as expected.

External tuber defects were minimal in 1998 and there were no significant differences between entries. Symptoms of IHN were greater than in the past two or three years, reflecting the warm weather in May. However, the intensity of IHN was not severe. Clone influenced neither the

incidence nor the severity of IHN, but both were increased by delays in harvest.

Based upon the results of this study, ATBT04-36 may be more consistent in emergence and early vigor than the standard, but these early season criteria appear to have little impact on final marketable yield. The multivariate analyses for size distribution indicated that a significantly greater portion of the total yield was in the larger size categories for the standard and ATBT04-06 than for -36. This propensity of ATBT04-36 to set more tubers at the expense of size could be detrimental, particularly in growing seasons with increased stress during the period of tuber bulking. Differences between ATBT04-06 and -31 and the non-transgenic standard were subtle, but improved skin maturity and tuber appearance of ATBT04-06 may be sufficient to suggest a preference for this growing area.

Ratings

Vine and tuber ratings were completed using the rating system of the U.S. Department of Agriculture regional project NE184. For vine ratings, maturity: 1= senesced, 9 = totally green; air pollution: 1 = defoliated, 9 = no visible symptoms. For tuber ratings, shape: 1= round, 5 = oblong, 9 = very long (cylindrical); appearance: 1 = very poor, 9 = excellent; skin maturity: 1 = totally peeled during harvest and grading, 9 = skin intact; and tuber defects: 1 = severe, 9 = none. Ratings of heat necrosis were made on 20 tubers in the size range 2 1/2" to 3 1/4".

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Virginia Table 1. Yield, marketable yield, percentage of yield by grade size distribution, specific gravity, and chip color of round-white trial grown for 97 days at Painter, Virginia, 1998.

Clone ¹	Yield >1-1/2" cwt/A	Marketable Yield		Size Distribution ² By class (%)				Percentage over		Percent Defects	Specific Gravity ³	Chip Color ⁴
		cwt/A	Percentage of std.	1	2	3	4	1.88"	2.5"			
Andover	327	265	103	19	29	47	4	80	51	1	1.070	1
Atlantic	354	306	119	13	15	50	21	86	71	1	1.082	3
Superior (std)	340	259	100	23	27	46	4	76	49	1	1.067	4
AF1470-6	330	259	100	18	18	58	7	78	60	5	1.054	4
AF1569-2	404	339	131	16	20	54	10	84	64	<1	1.068	2
AF1758-7	351	229	89	22	20	40	4	65	45	14	1.059	3
AF1791-1	414	372	144	9	9	62	19	90	81	2	1.063	-
AF1845-6	384	355	138	7	11	64	18	92	81	1	1.077	-
B0564-9	368	313	121	15	16	52	17	85	69	<1	1.075	2
B1214-7	331	299	116	9	12	67	12	91	79	1	1.074	-
B1240-1	316	287	111	9	11	63	17	91	80	0	1.077	3
B1429A-3	382	284	110	26	31	41	2	74	43	0	1.077	-
B1435-15	354	316	123	11	16	52	22	89	73	<1	1.071	2
B1452-18	334	221	86	33	28	35	2	65	37	2	1.068	-
NYR17-7	392	306	119	20	23	49	6	78	55	<1	1.067	2
NYR17-11	288	236	92	18	23	55	4	82	59	3	1.062	-
NYR17-106	371	269	104	27	26	44	2	72	46	1	1.062	3
Waller-Duncan												
K=100, P=0.05	37	38										

¹ Planted March 31, harvested July 6, 1998.

² Size distribution 1 = 1.5-1.88"; 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = >3.25."

³ Determined by weight in air/weight in water method.

⁴ Unreplicated samples, 97 days after harvest: 1-4 = acceptable, 5 = marginal, 6 or greater = unacceptable.

Virginia Table 2. Yield, marketable yield, percentage of yield by grade size distribution, specific gravity, and chip color of chip trial grown for 97 days at Painter, Virginia, 1998.

Clone ¹	Yield		Marketable Yield		Size Distribution ²			Percentage over		Percent Defects	Specific Gravity ³	Chip Color ⁴
	>1-1/2"	cwt./A	cwt./A	Percentage of std.	1	2	3	1.88"	2.5"			
Atlantic (std)	386	328	100		14	18	55	85	67	1	1.081	3
Superior	353	297	91		16	21	56	84	63	<1	1.062	4
AF1753-12	360	240	74		33	30	32	66	36	1	1.064	4
AF1857-2	367	226	69		38	34	27	62	28	<1	1.073	3
B0766-3	410	320	98		22	22	49	78	57	<1	1.074	3
B1425-9	376	266	82		29	28	39	71	42	1	1.082	2
B1440-18	358	306	94		14	18	65	86	68	1	1.063	2
NY119	344	286	88		17	19	56	83	64	0	1.083	2
NY120	351	292	90		17	25	53	83	58	<1	1.076	2
Waller-Duncan												
K=100, P=0.05	62	42										

¹Planted March 31, harvested July 6, 1998.

²Size distribution 1 = 1.5-1.88"; 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = >3.25."

³Determined by weight in air/weight in water method.

⁴Unreplicated samples, 97 days after harvest: 1-4 = acceptable, 5 = marginal, 6 or greater = unacceptable.

Virginia Table 3. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity of commercial trial grown for 97 days at Painter, Virginia, 1998.

Clone ¹	Yield >1-1/2" cwt/A	Marketable Yield		Size Distribution ² By class (%)				Percentage over		Percent Defects	Specific Gravity ³
		cwt/A	Percentage of std.	1	2	3	4	1.88"	2.5"		
Adora	354	278	107	20	22	51	6	79	57	1	1.053
Atlantic	372	318	122	14	17	54	15	85	69	1	1.080
Caesar	307	211	81	29	35	34	0	69	34	2	1.064
Cosmos	395	299	115	19	24	50	1	76	51	5	1.067
Provento	428	202	78	44	30	17	0	47	17	10	1.064
Superior (std)	317	262	100	17	22	55	6	83	61	1	1.065
Victoria	306	170	65	41	32	23	1	55	24	4	1.065
Yukon Gold	280	213	82	23	26	50	<1	76	50	1	1.070
Waller Duncan											
K=100, P=0.05	49	45									

¹ Planted March 31, harvested July 7, 1998.

² Size distribution 1 = 1.5-1.88"; 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = >3.25."

³ Determined by weight in air/weight in water method.

Virginia Table 4. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity of red-skinned trial grown for 98 days at Painter, Virginia, 1998.

Clone ¹	Yield >1-1/2" cwt/A	Marketable Yield		Size Distribution ² By class (%)					Percentage over		Percent Defects	Specific Gravity ³
		cwt/A	of std.	1	2	3	4	1.88"	2.5"			
Cherry Red	167	96	172	42	35	21	1	57	22	1	1.069	
Chieftain	257	175	313	31	26	41	0	68	41	2	1.059	
Dark Red Norland	135	56	100	59	29	11	0	39	11	2	1.051	
NorDonna	242	132	236	46	30	24	0	54	24	<1	1.058	
Red LaSoda	275	221	395	20	22	52	6	80	58	<1	1.058	
Rideaux	265	195	349	26	27	45	1	73	46	<1	1.063	
Super Red Norland	155	84	150	46	29	24	1	53	24	1	1.043	
B0852-7	207	151	270	28	24	47	2	72	49	0	1.071	
B1145-2	127	46	83	58	33	8	1	42	9	0	1.055	
B1491-5	150	67	120	56	26	17	0	43	17	1	1.064	
B1491-20	88	14	25	82	13	4	0	17	4	1	1.056	
B1492-12	206	62	111	70	22	8	0	30	8	1	1.065	
B1493-2	189	90	161	50	28	19	<1	47	19	3	1.069	
ND22245R	135	37	67	75	22	3	0	24	3	<1	1.055	
Waller Duncan												
K=100, P=0.05	30	23										

¹ Planted March 31, harvested July 7, 1998.

² Size distribution 1= 1.5-1.88", 2 = 1.88-2.5", 3 = 2.5-3.25", 4 = >3.25"

³ Determined by weight in air/weight in water method.

Virginia Table 5. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity of russet trial grown for 98 days at Painter, Virginia, 1998.

Clone ¹	Yield >1-1/2" cwt/A	Marketable Yield		Size Distribution ²					Percentage over		Percent Defects	Specific Gravity ³
		cwt/A	Percentage of std.	By class (%)				> 4 oz.	> 8 oz.			
				1	2	3	4					
Amey	333	216	122	34	50	12	1	64	13	2	1.110	
Century Russet	295	170	96	37	51	5	<1	57	5	7	1.071	
Innovator	314	221	125	24	54	15	2	70	17	6	1.071	
Russet Norkotah (std)	315	178	100	43	46	9	1	56	10	1	1.064	
Russet Norkotah #3	289	187	106	33	59	5	1	65	6	2	1.066	
Russet Norkotah #8	384	255	144	30	55	10	1	67	11	3	1.068	
B1004-8	336	196	111	43	48	9	<1	57	9	<1	1.072	
B0835-11	298	211	119	25	47	19	5	71	24	3	1.067	
B1463-1	234	166	94	27	60	11	1	72	12	1	1.070	
W1099	318	227	128	26	58	11	2	71	13	3	1.067	
Waller - Duncan												
K=100, P=0.05	53	79										

¹ Planted March 31, harvested July 7, 1998.

² Size distribution 1 = 1.5-1.88", 2 = 1.88-2.5", 3 = 2.5-3.25", 4 = >3.25."

³ Determined by weight in air/weight in water method.

Virginia Table 6. Plant and tuber characteristics and tuber defects for round-white, chip, and commercial clones grown at Painter, Virginia, 1998.

Clone	Vine ¹ Maturity	Air Pollution	Tuber ¹			Tuber Defects					
			Shape	Appear.	Skin Matur.	Heat Necrosis ²					
						Sprouts	Sun- Burn	Second Growth	Growth Crack	# of Tubers	Rating
Andover	5	7	4	7	8	9	9	9	9	0	9
Atlantic	7	9	2	7	6	9	9	9	9	2	8
Superior	5	9	3	6	8	9	9	9	9	0	9
AF1470-6	4	7	3	7	8	9	9	9	9	2	8
AF1569-2	6	9	2	6	6	9	9	9	9	0	9
AF1758-7	9	9	2	5	6	6	9	4	9	0	9
AF1791-1	7	7	3	5	6	9	9	7	6	0	9
AF1845-6	8	8	3	6	5	9	9	9	6	0	9
B0564-9	6	7	2	8	6	9	9	9	9	0	9
B1214-7	9	9	3	6	5	9	9	9	9	1	7
B1240-1	9	9	2	7	6	9	9	9	9	0	9
B1429A-3	5	8	2	7	7	9	9	9	9	0	9
B1435-15	6	6	2	8	7	9	9	9	9	1	6
B1452-18	8	6	4	6	7	6	9	6	7	0	9
NYR17-7	7	8	2	6	7	9	9	6	9	0	9
NYR17-11	6	7	2	7	7	9	9	9	9	0	9
NYR17-106	7	8	3	7	6	9	9	7	9	0	9
Chip Trial											
Atlantic	8	7	2	7	6	9	9	9	9	4	8
Superior	6	8	3	6	7	9	9	9	9	0	9
AF1753-12	5	4	4	6	7	9	8	9	9	0	9
AF1857-2	6	6	2	7	7	9	9	9	9	0	9
B0766-3	9	8	2	6	7	9	9	9	9	0	9
B1425-9	8	7	2	7	6	9	9	7	9	0	9
B1440-18	7	9	4	6	7	9	9	9	9	0	9
NY119	5	8	2	7	7	9	9	9	9	3	5
NY120	8	6	2	6	7	9	9	9	9	0	9

Virginia Table 6. (Continued)

Clone	Vine ¹ Maturity	Air Pollution	Tuber ¹			Tuber Defects					Heat Necrosis ²		
			Shape	Appear.	Skin Matur.	Sprouts	Sun- Burn	Second Growth	Growth Crack	# of Tubers	Rating		
Commercial Trial													
Adora	5	8	5	6	6	9	9	9	9	0	9		
Atlantic	8	7	2	7	5	9	9	9	9	7	6		
Caesar	9	9	4	5	5	5	9	7	9	1	8		
Cosmos	8	9	3	5	5	9	9	9	5	8	6		
Provento	8	6	3	6	6	9	9	8	9	4	6		
Superior	5	9	3	6	7	9	9	9	9	0	9		
Victoria	9	9	3	6	6	9	9	9	9	8	7		
Yukon Gold	4	4	3	6	6	9	9	9	9	3	8		

¹Vine maturity ratings taken 89 days after planting. NE184 rating system used (9 = exceptional or desirable, 1 = not acceptable)

² Twenty tubers sampled.

Virginia Table 7. Plant and tuber characteristics and tuber defects for red skinned and russet clones at Painter, Virginia, 1998.

Clone	Vine ¹			Tuber ¹			Tuber Defects					Heat Necrosis ² # of Tubers	Rating	
	Maturity	Air		Shape	Appear.	Skin Matur.	Color	Texture	Sprouts	Sun- Burn	Second Growth			Growth Crack
Cherry Red	6	7		3	5	6	2	7		9	9	9	0	9
Chieftain	7	8		2	6	6	3	6		7	7	9	4	8
Dark Red Norland	4	3		3	6	8	2	7		8	9	9	0	9
Nordonna	7	9		2	7	7	2	7		9	9	9	0	9
Red Lasoda	5	7		3	6	6	3	6		9	9	9	0	9
Rideaux	4	8		3	7	6	3	7		9	9	7	0	9
Super Red Norland	2	2		2	6	7	2	7		9	9	7	0	9
B0852-7	5	6		3	6	6	1	7		9	9	9	0	9
B1145-2	2	2		2	7	8	2	7		9	9	9	0	9
B1491-5	5	5		2	6	6	2	6		9	9	9	8	6
B1491-20	3	3		2	5	8	2	6		7	9	9	0	9
B1492-12	6	7		2	7	8	2	7		8	9	9	0	9
B1493-2	5	6		3	6	7	2	7		9	7	9	1	8
ND22245R	2	3		3	6	8	2	7		9	9	9	0	9
						Russet-skinned								
Amey	8	7		6	7	6	4	4		9	9	9	0	9
Century	9	9		6	4	5	5	5		9	9	9	0	9
Innovator	8	9		7	6	5	5	4		9	9	9	0	9
Russet Norkotah	7	7		7	5	6	4	3		9	9	9	0	9
Russet Norkotah#3	9	8		6	5	5	4	2		9	9	9	0	9
Russet Norkotah#8	8	8		6	7	5	4	3		9	9	9	0	9
B1004-8	7	5		6	6	6	4	3		9	9	9	0	9
B0835-11	7	6		6	5	6	4	3		9	9	9	0	9
B1463-1	5	4		7	6	7	4	3		9	9	9	0	9
W1099	5	6		7	5	5	5	4		9	7	9	0	9

¹Vine maturity ratings taken 89 days after planting. NE184 rating system used (9 = exceptional or desirable, 1 = not acceptable).

² Twenty tubers sampled.

Virginia Table 8. Plant, vine and tuber characteristics of Virginia 1998 transgenic trial.

Treatment	Plant ¹				Vine ¹				Tuber ¹							
	Stand count ³	Uniformity	Vigor	Stem Count ⁴	Vine Size	Maturity	Pollution	Shape	Size	Set	Appearance	Skin Mat.	Color	Texture ⁵	Eye Depth	Uniformity
Clone																
ATBT04-06	27.0	6.0	6.7	21.8	7.1	6.8	8.5	2	5.8	6.9	6.5	6.1	6	5.7	6.2	5.9
ATBT04-31	27.8	5.6	6.8	25.5	7.0	6.7	8.7	2	5.6	6.8	6.3	5.9	6	5.7	6.4	6.3
ATBT04-36	28.4	6.2	7.0	24	6.8	6.5	8.6	2	5.5	7.0	6.2	5.8	6	5.7	6.3	6.1
Atlantic (std)	27.2	5.7	6.3	23	7.3	6.7	8.7	2	5.7	6.6	5.7	5.2	6	5.7	6.1	6.5
Waller/Duncan (P=.05)	1.3	NS	0.6	2	0.3	NS	NS	NS	NS	NS	0.3	0.2	NS	--	NS	0.2
Harvest (DAP) ²																
83	28.5	5.8	7.0	24.4	7.0	6.6	8.6	2	5.8	7.6	6.7	5.2	6	7	6.9	6.6
97	26.8	5.9	6.7	23.4	7.3	6.7	8.6	2	6.2	7.6	6.7	5.8	6	5	5.9	6.8
111	27.5	5.8	6.5	23.1	6.9	6.6	8.7	2	5.0	5.3	5.1	6.2	6	5	5.9	5.3
Waller/Duncan (P=.05)	0.9	NS	0.5	NS	0.3	NS	NS	NS	0.3	0.3	0.3	0.2	NS	--	0.2	0.2

¹Scoring system of NE184: 9=exceptional or ideal, 1=unacceptable or poor.

²Days after planting.

³Plants per 30 row feet.

⁴Stems per 10 consecutive plants.

⁵Netting had not fully developed by the first harvest, but was consistent within each harvest. Because of the lack of variation, the error mean square was small, the statistical analyses may be misleading.

Virginia Table 9. Yield, marketable yield, size distribution, and specific gravity of Atlantic transgenic trial.

Treatment Clone	Yield		Size Distribution ²				Percentage Over 1.88" 2.5"	Pick out (%)	Specific Gravity ³
	Total (cwt./A)	Market	Percentage of Market Std	1	2	3	4		
ATBT04-06									
ATBT04-31	222	174	103	20	28	48	2	79	51
ATBT04-36	219	170	101	21	28	47	3	77	49
Atlantic (std)	220	168	100	23	31	43	1	75	44
Waller/Duncan (P=.05)	208	168	100	18	25	50	5	80	55
Harvest (DAP) ¹	13	NS	--	Manova, Wilk's Lambda (P=.01)				3	5
83	235	167	--	29	32	38	1	71	39
97	263	219	--	16	25	54	4	83	58
111	155	124	--	17	27	50	3	80	53
Waller/Duncan (P=.05)	9	7	--	Manova, Wilk's Lambda (P=.01)				2	4

¹Days after planting.²Size distribution: 1 = 1.5 - 1.88", 2 = 1.88 - 2.5", 3 = 2.5 - 3.25", 4 = >3.25"³Determined by weight in air/weight in water method.

Virginia Table 10. Average tuber size and internal and external tuber defects.

Treatment	Average weight (lbs./tuber)		Internal Heat Necrosis ³		External Defects ⁴		
	Total	Marketable ²	Percentage	Rating	Sec. Growth	Gr. Cracks	Sunburn
Clone							
ATBT04-06							
ATBT04-31	.23	.28	35.0	8.4	8.9	8.9	9.0
ATBT04-36	.24	.30	32.1	8.4	8.7	8.6	9.0
Atlantic (std)	.23	.27	33.3	8.6	8.8	8.8	8.8
Waller/Duncan (P= .05)	.24	.29	36.3	8.4	8.8	8.8	8.9
Harvest (DAP) ¹	.01	.02	NS	NS	NS	NS	NS
83	.21	.28	23.1	8.8	8.8	8.9	9.0
97	.26	.31	42.8	8.3	8.6	8.8	8.9
111	.24	.27	36.6	8.3	8.9	8.7	8.9
Waller/Duncan (P= .05)	.01	.02	7.8	0.1	NS	NS	NS

¹Days after planting.²Tubers > 1.88" in diameter.³10 tubers per replicate cut and evaluated. Rating :9 = no visible necrosis, 1 = total involvement of the parenchyma tissue.⁴NE184 system: 9 = no defects, 1 = worst case.

Wisconsin Potato Variety Trials

Horia Groza, Bryan Bowen, and Jiming Jiang.

In the Wisconsin breeding program the advanced selections are tested in the fifth and sixth field generations in replicated trials at two locations. After being included for two other years in the State field trial system (these results are not shown in the present report), the best lines are tested for three years in the North Central Regional Trial (NCRT).

The 5th and 6th field generation trials were conducted in Rhinelander, under shorter and colder season conditions, and in Hancock, under longer and warmer season conditions, on irrigated sandy soil. They were planted in a randomized block design with single row plots of 20 hills/plot, 3 replications and 12"x36" spacing. Planting, vine killing and harvest date: (1) in Rhinelander - 5/4/98, 8/18/98 and 8/31/98; (2) in Hancock - 4/23/98, 8/18/98 and 9/3/98, respectively. The NCRT was conducted in Hancock under exactly the same conditions and dates as the previously mentioned Hancock trials but in a randomized block design of four replications.

The yield was graded into A size (>1 7/8" diameter), B size (<1 7/8") and culls. The vigor at the second blooming, early blight at the beginning of August and vine maturity were scored on a 1-9 scale (1 = very weak, very susceptible or very early, respectively). Common scab on tubers was scored on a 1-9 scale (1 = very susceptible). The tubers were described for shape (1=round, 5=oval, 9=long) and shape uniformity (9=very uniform), and flatness. Five tubers larger than 8

oz were cut lengthwise for scoring the internal defects of the tubers. A general preference score for tuber external and internal appearance has been used (1=undesirable, 2=acceptable, 3=good, 4=very good). Specific gravity was determined by measuring the weight in air and water and the table values are expressed as $(SG - 1) \times 1000$. Chip color was scored for five tubers per plot, from 1 to 10, according to the PCII Color Chart (where 1 is the lightest and 4 is the maximum accepted). A composite sample of all the five slices was then measured with a HunterLab spectrophotometer Colorquest 45/0 (acceptance level >60). The frying time interval lasted until "the bubbling" stopped (this way one measures the reducing sugars factor and eliminates the solids factor). The chip color for the trials including the advanced selections was determined at reversion (a month storage at 55°F) and after three month storage at 40°F with and without reconditioning (two weeks at 65°F). In the North Central Regional Trial the chip color was measured only after 3 month storage at 40°F. In 1998, all the tubers which were to be stored at 40°F did not undergo a prior two week healing and gradual cooling treatment, which made the test more severe and the chips much darker.

Susceptibility to common scab (*Streptomyces scabies*) of several advanced selections was tested in a highly infested field plot of sandy-loam stony soil, which was maintained dry and at a high pH. The design was a randomized block design with three replications and 12 hill plots. Between plots a highly infected tuber was planted, preceded and followed by one purple marker tuber hill. Tubers were scored on a 1-9 scale for the maximum intensity per plot (1 = 100% lesion covered tuber, 9 = no symptoms).

Characteristics of experimental lines in NCRT, Hancock 1998.

MN 16478 rus - russet, medium late, vigorous haulm, medium susceptibility to early blight, medium yield, long oval/oval tubers, medium resistance to scab, no hollow heart and internal brown spot but high incidence of vascular discoloration, good solids.

MN 16966 rus - russet, late, vigorous haulm, medium resistance to early blight, good yield, oval blocky tubers, very light russetting, good tuber size, medium susceptibility to scab, practically no internal defects, good solids.

MN 17572 R - red skin, medium late, less vigorous haulm, susceptible to early blight, good yield, smaller size tubers, pale color of skin, medium resistance to scab, practically no external defects, no internal defects, low solids.

MN 17922 R - red skin, medium late, medium vigorous haulm, medium susceptibility to early blight, good yield, large size tubers, very good intense color of skin but sometimes buck skin is noticeable, attractive tuber appearance, resistant to scab, few growth cracked or offshape tubers, skinning, no hollow heart and internal brown spot but some incidence of vascular discoloration, low solids.

MSA 091-1 - late, vigorous haulm, medium resistance to early blight, medium susceptibility to Rhizoctonia, good yield, round oval tubers with light netting and obvious lenticels, very resistant to scab, high vascular discoloration incidence, chip color equal to the better standards in trial, very good solids.

MSB 073-2 - late, vigorous haulm, medium resistance to early blight,

excellent yield, smaller size round tubers with good skin set, practically no external and internal defects, excellent solids.

MSE 192-8 rus - russet, late, vigorous haulm, medium susceptibility to early blight, good yield, long narrow tubers with dark russet skin, some skinning, high percentage of offshape tubers, very resistant to scab, practically no internal defects, low solids.

MSE 230-6 rus - russet, late, medium vigorous haulm, medium susceptibility to early blight, good yield, oval/long oval tubers, white with patchy russetting, many knobby tubers, resistant to scab, practically no internal defects, good solids.

ND 2470-27 - late, vigorous haulm, medium susceptibility to early blight, medium yield, large round oval tubers, good tuber appearance, obvious lenticels, medium susceptibility to scab, practically no external and internal defects, good chip color, medium good solids.

ND 2676-10 - medium early/medium late, less vigorous haulm, susceptible to early blight, round smooth and uniform tubers, very attractive tuber appearance, heat sprouts, medium resistance to scab, high incidence of vascular discoloration, good chip color, medium solids. It ranked number one in NRCT in Hancock in 1998.

ND 4093-4 rus - russet, medium early, not vigorous haulm, susceptible to early blight, blocky medium dark tubers, excellent tuber appearance, resistant to scab, medium low solids, good chip color, a fairly good cold chipper (except when reconditioned from 3 month storage at 40°F), practically no external defects, no internal defects. It ranked number two in

NRCT in Hancock in 1998

ND 5084-3 R - red skin, medium late/late, vigorous haulm, medium resistance to early blight, medium yield, excellent red color, attractive appearance, skinning, medium susceptibility to scab, vascular discoloration, low solids.

W 1151 rus - russet, medium early/medium late, medium vigorous haulm, medium susceptibility to early blight, good yield, very attractive blocky medium dark tubers (Norkotah type), early tuber set, large size tubers, sometimes lenticels become visible, medium susceptibility to scab, practically no external defects, vascular discoloration, low solids. It ranked 5th in NCRT.

W 1313 - medium late/late, vigorous haulm, fairly resistant to early blight, excellent yield, uniform round-oval tubers, shallow eyes, netting, good skin set, susceptible to pitted scab, susceptible to shatter bruises, excellent solids, good chip color. It ranked 3rd in NCRT.

W 1348 rus - russet, medium late/late, vigorous vines, medium resistance to early blight, good yield, long medium dark tubers, Russet Burbank type, several bottle neck shaped tubers were noticed in 1989 as in Russet Burbank, dual purpose potato, very resistant to scab, resistant to Rhizoctonia, good solids.

W 1355-1 - medium late/late, medium vigorous haulm, medium resistance to early blight, good yield, round oval tubers, smaller size, good chip color, practically no defects, good solids.

FV 8957-10 - medium early/medium late, less vigorous haulm, very susceptible to early blight, medium

good yield, round smooth tubers, very attractive appearance, medium susceptibility to scab, practically no defects, low solids.

WIS 75-30 - medium late/late, medium vigorous haulm, medium resistance to early blight, round oval/oval tubers, medium shallow eyes, variable shape and size, medium resistance to scab, good chip color, very good solids.

Wisconsin Table 1. Advanced Selection Trial 1, Rhinelander 1998 (106 days).

Cultivar	Cwt/A		Vines			Tubers			Internal Def. %		
	Tot	A's	VMt	Vig	EBt	SkG	TbU	Scb	HH	IBS	VD
Atlantic	418	381	5.3	5.2	6.3	8.5	8.5	8.5	20	00	00
DRNorland	337	313	4.0	3.3	4.0	8.7	7.3	8.2	06	00	00
Goldrush	306	259	4.5	4.8	2.8	9.0	7.7	8.2	00	00	00
RBurbank	325	214	4.0	5.5	4.2	9.0	6.0	8.0	00	00	00
RNorkotah	317	268	3.3	4.0	2.3	9.0	9.0	8.5	20	00	00
Snowden	351	329	5.3	5.7	6.5	9.0	9.0	8.5	00	00	20
Superior	270	244	2.7	3.7	3.3	9.0	8.3	8.7	00	06	14
W 1767-1	335	307	6.7	6.7	7.3	8.8	8.3	8.0	00	00	00
W 1769-7	345	326	6.3	5.7	6.8	5.3	8.2	8.7	00	00	00
W 1770-6	359	333	6.7	4.7	7.0	5.7	6.7	8.0	00	00	00
W 1773-3	407	377	5.2	5.0	5.7	7.7	7.7	8.3	00	00	00
W 1773-7	239	181	4.5	4.0	1.7	7.7	7.7	7.5	00	00	00
W 1774-1	310	248	5.3	5.7	4.7	8.7	8.7	7.5	06	06	00
W 1775-2	303	241	3.7	4.0	3.0	9.0	7.7	8.7	00	00	00
W 1775-14	309	258	4.8	4.3	5.0	9.0	9.0	8.8	00	00	00
W 1779-1	275	254	5.0	5.3	4.0	7.3	8.3	9.0	06	00	00
W 1782-5	306	276	4.3	3.8	5.2	7.3	8.3	9.0	00	00	00
W 1782-14	285	259	5.5	4.5	6.8	6.3	9.0	7.8	00	00	00
W 1782-19	387	352	5.3	5.8	5.7	6.8	8.3	8.7	00	00	0
W 1801-4	360	317	4.5	5.0	4.3	8.2	8.7	8.2	00	14	00
W 1806-3	331	306	4.2	5.0	5.0	8.7	7.7	8.2	06	06	00
W 1806-9	314	282	5.5	5.0	5.3	8.5	8.3	8.3	00	06	00
W 1811-1	379	330	6.3	6.8	7.7	5.5	8.5	8.5	00	00	00
W 1812-8	262	218	3.5	3.8	2.7	8.0	7.0	8.0	00	00	10
W 1812-22	358	348	4.8	5.2	4.8	7.0	8.3	7.0	00	00	00
W 1815-5	328	301	5.0	4.8	4.7	8.3	8.5	8.5	06	14	00
W 1815-6	303	269	7.2	6.3	8.3	4.0	8.0	8.3	00	00	06
W 1817-4r	399	335	7.3	6.3	7.3	8.3	7.7	9.0	00	06	00
W 1823-2r	346	310	5.2	5.5	6.0	8.3	7.3	8.3	00	00	00
W 1836-3r	427	371	7.0	6.7	8.3	7.8	7.7	9.0	00	00	00
W 1839-3r	286	248	4.7	4.8	3.8	8.5	8.3	9.0	00	00	00
W 1848-2R	288	205	3.7	5.0	1.8	9.0	9.0	8.8	00	00	00
W 1860-1r	371	327	4.5	5.2	5.3	8.8	7.3	7.0	00	00	00
W 1864-4r	275	221	5.2	5.5	4.7	9.0	8.7	9.0	26	00	00
W 1949-4	375	335	4.5	5.0	5.8	7.3	8.7	8.7	00	00	00
W 1952-1R	302	266	5.5	4.5	4.5	7.3	9.0	9.0	00	00	00
W 1962-1R	335	274	3.5	4.2	2.7	8.8	8.3	7.8	00	00	0
Average	330	284	5.0	5.0	5.0	7.9	7.1	8.4	03	02	01

Tot = Total yield, A's = A size (>1 7/8" tubers) yield; VMt: Vine maturity (1=early, 9=late); Vig: Vine vigor (1=weak, 9=vigorous); EBt: Early blight (1=very attacked, 9=no attack); SkG: Skinning (9 = no skinning); TbU: Tuber shape uniformity (9=very uniform); Scb: Scab (1=very attacked, 9=no attack); HH=Hollow heart (%); VD=Vascular discoloration (%); IBS=Internal Brown Spot (%).

Wisconsin Table 2. Advanced Selection Trial 1, Rhinelander 1998 (106 days).

Cultivar	SpGv	Chip Color					
		Rev		3mD		3mR	
		-----		-----		-----	
		Vis.	L	Vis.	L	Vis.	L
Atlantic	84	3.2	58.4	8.1	33.8	6.2	39.9
DRNorland	60	5.0	52.1	9.9	27.4	9.9	28.6
Goldrush	65	6.8	47.4	9.9	27.1	7.9	32.8
RBurbank	64	4.8	55.2	9.9	27.1	9.9	36.4
Snowden	73	2.8	60.7	7.4	38.6	5.2	48.2
Superior	69	4.1	55.3	9.6	30.2	8.7	32.1
W 1767-1	74	3.1	61.7	7.5	36.5	4.6	52.4
W 1769-7	76	2.7	59.7	7.4	39.2	6.5	40.6
W 1770-6	74	3.1	58.5	5.9	44.8	3.8	51.5
W 1773-3	74	2.8	60.2	7.0	38.3	4.2	54.2
W 1773-7	76	2.7	62.1	5.8	47.2	3.5	58.9
W 1774-1	92	2.7	59.4	6.6	41.5	4.5	53.8
W 1775-2	72	2.8	58.2	6.5	42.9	3.9	53.7
W 1775-14	69	3.5	58.5	7.2	40.4	6.1	46.5
W 1779-1	73	3.5	58.8	6.4	43.4	4.2	52.3
W 1782-5	76	2.9	60.1	6.9	41.2	3.9	50.8
W 1782-14	93	2.8	60.2	7.9	37.7	7.1	41.1
W 1782-19	76	2.9	59.2	9.2	30.4	6.4	47.3
W 1801-4	78	2.5	61.7	8.7	31.4	7.3	37.8
W 1806-3	87	2.8	59.3	8.4	33.8	4.5	52.3
W 1806-9	87	3.0	62.1	8.4	38.7	4.1	56.2
W 1811-1	80	2.9	60.3	8.5	37.9	6.5	50.6
W 1812-8	74	3.5	57.8	7.7	38.8	5.1	48.9
W 1812-22	81	2.4	63.9	6.3	44.8	3.5	56.8
W 1815-5	85	3.0	59.7	7.7	40.6	4.6	48.5
W 1815-6	82	3.5	56.9	8.0	33.9	5.4	50.7
W 1817-4rus	71	6.2	50.3	9.5	28.2	7.9	38.1
W 1823-2rus	75	3.2	59.0	8.8	35.0	7.7	39.8
W 1836-3rus	109	5.6	50.9	9.8	25.8	8.8	33.3
W 1839-3rus	62	5.1	49.8	9.7	24.9	8.7	25.7
W 1848-2R	61	4.2	58.0	9.3	32.0	7.8	32.8
W 1860-1rus	64	5.2	53.3	9.9	26.8	9.7	30.3
W 1864-4rus	65	5.5	51.5	9.5	31.8	7.7	36.9
W 1949-4	79	2.8	61.1	6.2	45.0	3.3	57.8
W 1952-1R	62	5.7	51.4	9.9	27.6	9.3	30.1
W 1962-1R	68	5.1	52.1	9.9	27.6	9.9	29.8
Average	75	3.9	57.4	8.2	35.3	6.3	43.9

SpGv: Specific Gravity -1 x 1000; Chip Color: Rev = Reversion, 3m = 3 month storage at 40°F (D=direct, R = reconditioned 14 days at 65°F). Vis = visual scores in CPII scale (1=light, 10=dark); L = lightness readings with HunterLab Colorquest 45/0.

Wisconsin Table 3. Advanced Selection Trial 2, Rhinelander 1998 (106 days).

Cultivar	Cwt/A		Vines			Tubers			Internal Def. %		
	Tot	A's	VMt	Vig	EBt	Skg	TbU	Scb	HH	IBS	VD
Atlantic	238	213	5.0	5.0	5.8	9.0	9.0	8.3	20	00	00
Goldrush	362	336	4.0	3.7	2.5	9.0	7.5	9.0	00	00	00
RNorkotah	300	268	2.3	2.7	1.2	9.0	8.3	8.7	06	00	00
RBurbank	270	231	4.0	5.2	4.2	9.0	5.7	9.0	00	00	00
Snowden	335	274	5.2	5.5	6.0	9.0	8.5	8.5	00	00	00
Superior	294	267	2.8	3.3	2.3	9.0	7.7	9.0	00	00	06
W 1149	367	331	7.0	6.7	8.5	5.0	7.3	7.8	06	00	00
W 1290	366	328	4.8	4.2	5.5	5.0	6.0	8.7	14	00	00
W 1348rus	365	282	5.3	5.3	4.8	8.7	7.7	9.0	00	00	00
W 1355-1	350	314	5.3	5.3	5.2	8.0	8.3	7.8	00	06	06
W 1526-1	303	234	4.7	5.8	2.5	9.0	8.7	8.2	00	00	00
W 1566-5	344	301	3.5	4.5	2.0	8.0	8.7	8.0	06	00	00
W 1568-5	298	249	4.0	4.7	3.5	9.0	8.7	8.3	00	00	00
W 1569-2	294	190	6.0	5.0	6.7	7.7	7.7	9.0	00	00	14
W 1647-1	245	174	3.8	5.2	4.7	8.8	8.5	7.0	00	00	00
W 1742-1	325	288	3.3	5.0	2.0	9.0	8.7	9.0	00	00	06
W 1782-8	307	239	5.0	5.3	5.3	5.7	9.0	9.0	00	00	00
W 1806-2	293	253	4.3	4.2	4.3	9.0	9.0	9.0	00	06	00
W 1811-2	377	343	6.7	5.8	7.3	5.3	8.0	8.3	00	00	00
W 1816-13	281	251	4.2	5.2	3.0	9.0	9.0	8.3	00	00	00
W 1876-1r	415	376	4.2	4.7	3.3	9.0	9.0	9.0	00	00	00
W 1879-1r	271	206	4.2	4.5	3.2	9.0	8.0	8.7	06	00	00
W 1934-6	252	221	4.2	4.7	4.2	9.0	9.0	8.7	00	00	00
W 1935-3	363	312	5.0	4.0	5.5	9.0	7.8	9.0	00	00	00
W 1936-8	313	241	4.3	4.7	4.5	8.8	9.0	8.8	00	00	00
W 1938-6	300	261	3.8	5.2	3.2	9.0	7.0	6.0	00	00	20
W 1946-2	371	336	4.2	4.7	3.2	9.0	8.5	8.8	00	00	00
W 1946-3	278	230	3.5	4.0	3.7	9.0	8.3	9.0	00	00	00
W 2504-9	313	240	5.5	5.0	5.2	8.3	7.7	7.3	06	00	06
W 2507-2	333	293	5.2	4.7	5.5	6.3	7.7	8.3	00	00	00
Average	318	271	5.1	4.8	4.5	8.3	8.1	8.5	02	00	02

Tot = Total yield, A's = A size (>1 7/8" tubers) yield; VMt: Vine maturity (1=early, 9=late); Vig: Vine vigor (1=weak, 9=vigorous); EBt: Early blight (1=very attacked, 9=no attack); Skg: Skinning (9 = no skinning); TbU: Tuber shape uniformity (9=very uniform); Scb: Scab (1=very attacked, 9=no attack); HH=Hollow heart (%); VD=Vascular discoloration (%); IBS=Internal Brown Spot (%).

Wisconsin Table 4. Advanced Selection Trial 2, Rhinelander 1998 (106 days).

Cultivar	SpGv	Chip Color					
		Rev		3mD		3mR	
		Vis.	L	Vis.	L	Vis.	L
Atlantic	83	3.2	56.9	8.5	33.0	7.6	40.7
Goldrush	58	7.5	41.0	9.9	24.3	9.9	29.3
RNorkotah	56	5.9	51.5	9.9	24.2	9.9	31.0
RBurbank	66	5.9	51.2	9.9	28.2	9.4	31.2
Snowden	80	2.8	59.0	7.5	34.8	4.0	55.7
Superior	64	4.5	54.1	9.9	25.9	9.1	34.6
W 1149	80	3.0	57.7	7.4	36.8	4.6	51.1
W 1290	79	3.1	55.3	5.0	49.9	3.6	57.3
W 1348rus	64	4.9	52.4	9.5	27.0	9.4	32.5
W 1355-1	78	2.8	59.1	7.0	39.8	3.8	57.8
W 1526-1	83	2.8	61.1	7.8	36.9	7.1	44.6
W 1566-5	68	2.9	61.8	6.2	39.7	5.1	51.2
W 1568-5	80	2.5	61.4	7.9	33.8	6.3	43.9
W 1569-2	85	2.9	60.9	7.1	39.1	4.2	55.3
W 1647-1	87	4.0	59.5	8.0	34.6	4.8	48.4
W 1742-1	69	3.1	58.0	8.4	36.2	7.6	42.5
W 1782-8	80	2.8	61.9	6.7	38.1	4.5	54.1
W 1806-2	84	3.7	57.2	8.5	34.8	6.5	46.3
W 1811-2	85	3.0	59.6	7.6	35.8	4.7	52.8
W 1816-13	76	3.2	59.5	8.9	47.0	7.4	39.0
W 1876-1rus	71	4.6	52.8	9.3	28.6	8.1	36.5
W 1879-1rus	64	5.0	50.8	9.6	29.4	6.7	40.0
W 1934-6	83	3.0	61.0	7.4	39.2	3.3	57.5
W 1935-3	76	3.0	58.5	7.7	39.2	5.9	50.1
W 1936-8	85	3.6	57.4	7.2	37.2	5.6	50.2
W 1938-6	78	3.0	57.4	7.9	33.8	7.0	41.7
W 1946-2	73	3.3	57.2	7.5	37.0	4.5	54.5
W 1946-3	67	2.8	61.3	8.0	32.2	7.3	40.3
W 2504-9	86	2.7	61.5	5.3	46.2	2.7	62.1
W 2507-2	83	2.6	58.9	5.7	44.9	3.8	54.9
Average	76	3.6	57.2	7.9	35.6	6.1	46.2

SpGv: Specific Gravity -1 x 1000; Chip Color: Rev = Reversion, 3m = 3 month storage at 40°F (D=direct, R = reconditioned 14 days at 65°F). Vis = visual scores in CPII scale (1=light, 10=dark); L = lightness readings with HunterLab Colorquest 45/0.

Wisconsin Table 5. Advanced Selection Trial 1, Hancock, 1998 (118 days).

Cultivar	Cwt/A		Vines			Tubers				
	Tot	A's	VMt	Vig	EBt	TbS	TbU	Flt	Scb	Pref
Atlantic	489	467	5.5	5.5	4.5	2.3	9.0	5.0	8.3	2.5
RNorland	368	336	1.7	1.7	1.0	2.7	8.3	5.0	8.5	2.2
Goldrush	418	392	5.0	5.2	2.7	7.0	8.0	5.0	9.0	2.0
RBurbank	409	335	5.2	4.8	5.3	9.0	7.0	5.0	8.7	1.8
RNorkotah	414	383	3.7	3.5	2.0	7.0	9.0	5.0	9.0	2.3
Snowden	447	415	4.8	5.5	5.5	3.0	8.3	5.0	8.0	2.0
Superior	482	435	5.5	5.0	6.2	3.3	8.0	5.0	7.0	2.2
W 1767-1	365	356	5.3	6.0	4.8	2.3	9.0	5.0	9.7	2.5
W 1769-7	434	378	5.3	5.5	5.0	3.3	8.0	5.0	8.7	2.3
W 1770-6	434	388	6.5	4.3	7.0	5.0	6.7	4.3	6.3	1.3
W 1773-3	430	377	5.7	9.8	4.3	5.7	7.3	3.0	8.0	1.9
W 1773-7	450	417	5.5	5.3	4.3	3.0	8.3	4.0	8.8	2.2
W 1774-1	464	357	5.5	4.5	4.3	1.0	8.7	5.0	7.0	1.9
W 1775-2	376	316	6.0	3.7	5.7	7.3	8.3	5.0	9.0	1.4
W 1775-14	419	359	4.7	4.5	3.0	1.7	8.7	5.0	9.0	2.3
W 1779-1	402	339	4.8	4.3	4.0	2.7	7.3	4.3	7.8	1.9
W 1782-5	415	355	3.7	4.3	2.3	3.0	7.7	5.0	8.0	1.8
W 1782-14	264	224	4.3	4.7	2.7	3.0	8.0	5.0	7.3	1.7
W 1782-19	383	356	4.7	4.2	3.0	3.0	8.3	4.3	5.3	1.3
W 1801-4	359	325	5.0	5.0	2.5	2.3	9.0	5.0	8.7	2.3
W 1806-3	429	374	5.3	4.7	4.0	2.3	8.3	3.7	9.0	2.2
W 1806-9	397	348	5.2	4.7	4.3	2.3	7.7	5.0	9.0	2.2
W 1811-1	302	264	4.0	5.2	2.7	2.3	9.0	5.0	7.7	2.0
W 1812-8	382	330	2.3	3.0	1.5	5.0	8.7	4.3	6.8	1.3
W 1812-22	290	262	3.3	3.3	1.5	2.3	7.7	5.0	8.5	2.0
W 1815-5	295	264	4.3	4.5	3.3	1.7	9.0	5.0	8.3	2.2
W 1815-6	346	618	5.3	6.3	6.5	3.7	7.3	4.3	7.3	2.0
W 1817-4r	401	372	5.3	6.2	3.8	9.0	8.7	4.3	9.0	1.9
W 1823-2r	390	340	5.0	4.3	5.8	9.0	9.0	5.0	9.0	1.4
W 1836-3r	410	367	5.5	5.3	5.0	8.3	9.0	5.0	8.5	2.2
W 1839-3r	348	302	3.3	3.3	2.3	8.0	8.7	5.0	9.0	2.2
W 1848-2R	426	366	5.7	4.5	4.0	1.0	9.0	5.0	9.0	2.2
W 1860-1r	423	362	5.3	5.2	4.2	8.7	7.7	5.0	8.0	1.8
W 1864-4r	328	300	5.0	5.0	2.5	7.0	9.0	5.0	9.0	2.2
W 1949-4	353	309	5.2	4.7	3.7	1.7	9.0	5.0	8.3	2.0
W 1952-1R	381	335	3.7	3.3	2.0	1.0	9.0	5.0	8.0	2.1
W 1962-1R	377	308	2.0	3.7	1.0	1.7	8.3	5.0	8.7	2.2
Average	392	346	4.7	4.6	3.7		8.3		8.2	

Tot = Total yield (cwt/A); A's: A tuber size (>1 7/8") yield (cwt/A); VMt: Vine maturity (1=early, 9=late); Vig: Vine vigor (1=weak, 9=vigorous); EBt: Early blight (9=no attack); TbS: Tuber shape (1=round, 5=oval, 9=long); TbU: Tuber shape uniformity (9=very uniform); Flt = tuber flatness (1=very flat, 3=flat, 5=round); Scb: Scab (1=very attacked, 9=no attack); Pref: Preference (1=undesirable tubers, 2=acceptable tubers, 3=good tuber traits, 4=very good tuber traits).

Wisconsin Table 6. Advanced Selection Trial 1, Hancock, 1998 (118 days).

Cultivar	SpGv	Chip Color					
		Rev		3mD		3mR	
		Vis.	L	Vis.	L	Vis.	L
Atlantic	80	3.4	57.7	9.7	29.3	8.5	31.6
DRNorland	45	7.9	42.5	9.9	26.6	9.9	25.2
Goldrush	54	7.2	43.3	9.9	21.1	9.9	26.3
RBurbank	67	6.3	47.0	9.9	25.8	9.5	31.6
RNorkotah	59	6.3	50.1	9.9	24.6	9.7	30.2
Snowden	76	2.8	61.7	9.9	28.9	8.0	38.0
Superior	74	3.2	60.4	9.9	28.0	7.4	42.2
W 1767-1	70	3.0	61.4	9.6	30.6	8.0	37.7
W 1769-7	79	3.2	60.5	8.7	33.4	8.3	37.6
W 1770-6	64	3.6	54.1	8.7	33.8	7.3	40.1
W 1773-3	66	2.9	59.4	7.9	36.4	7.2	38.9
W 1773-7	72	3.2	58.4	9.9	26.3	8.1	42.1
W 1774-1	92	3.1	60.3	9.6	31.8	8.2	34.6
W 1775-2	69	2.7	60.2	8.7	32.5	7.0	43.9
W 1775-14	60	3.2	57.7	8.5	32.9	7.8	41.0
W 1779-1	70	3.3	58.6	9.5	30.4	8.3	37.3
W 1782-5	71	3.8	57.0	9.5	28.6	8.5	34.1
W 1782-14	87	3.0	61.0	9.3	31.2	8.3	36.2
W 1782-19	76	3.7	56.4	8.0	38.1	7.0	42.0
W 1801-4	73	3.5	56.2	9.7	25.8	9.0	32.2
W 1806-3	76	3.3	58.7	9.9	26.0	8.4	31.4
W 1806-9	79	2.9	61.9	9.9	26.4	8.6	34.7
W 1811-1	77	2.8	63.0	7.2	39.6	6.9	46.9
W 1812-8	75	2.7	62.5	9.3	32.6	7.9	36.4
W 1812-22	78	3.3	57.6	8.3	30.9	8.3	41.9
W 1815-5	77	3.1	56.8	8.5	34.6	8.8	35.7
W 1815-6	85	3.1	57.0	8.7	30.6	7.7	40.8
W 1817-4rus	67	6.0	51.5	9.9	28.1	8.8	33.3
W 1823-2rus	65	4.0	52.7	9.9	25.0	9.2	33.4
W 1836-3rus	61	6.0	47.1	9.9	25.0	9.8	27.4
W 1839-3rus	50	7.0	44.1	9.9	19.6	9.9	23.8
W 1848-2R	55	6.2	49.5	9.9	26.6	9.3	28.5
W 1860-1rus	59	7.3	41.1	9.9	21.5	9.9	25.2
W 1864-4rus	59	6.7	47.5	9.9	24.6	9.7	33.9
W 1949-4	70	2.9	61.0	8.9	33.3	8.2	40.0
W 1952-1R	55	6.7	45.0	9.9	22.0	9.9	28.9
W 1962-1R	52	7.1	41.8	9.9	24.4	9.9	24.1
Average	69	4.3	54.7	9.4	28.8	8.6	34.8

SpGv: Specific Gravity $\times 1000$; Chip Color: Rev = Reversion, 3m = 3 month storage at 40°F (D=direct, R = reconditioned 14 days at 65°F). Vis = visual scores in CPII scale (1=light, 10=dark); L= lightness readings with HunterLab Colorquest 45/0.

Wisconsin Table 7. Advanced Selection Trial 2, Hancock, 1998 (118 days).

Cultivar	Cwt/A		Vines			Tubers				
	Tot	A's	VMt	Vig	EBt	TbS	TbU	Flt	Scb	Pref
Atlantic	463	420	4.8	5.0	4.8	1.7	8.3	5.0	8.7	2.2
Goldrush	489	443	5.3	5.3	4.0	8.3	8.0	5.0	9.0	2.3
RNorkotah	396	354	4.3	4.2	2.7	7.0	9.0	5.0	8.7	2.7
RBurbank	487	387	4.8	4.5	5.2	8.3	7.3	5.0	9.0	1.9
Snowden	547	504	5.2	5.5	5.7	2.3	8.0	5.0	8.5	2.0
Superior	442	404	4.7	4.5	2.3	4.0	8.3	5.0	8.5	2.0
W 1149	461	441	6.3	6.3	6.0	4.3	7.7	4.3	8.7	2.2
W 1290	389	344	5.2	4.2	6.5	3.3	8.0	4.3	9.0	2.0
W 1348rus	479	395	5.2	6.5	5.5	9.0	7.7	5.0	9.0	2.3
W 1355-1	436	365	5.0	4.7	4.3	1.7	8.3	5.0	8.5	2.3
W 1526-1	462	364	5.0	5.2	3.2	1.7	8.3	4.7	8.2	2.0
W 1566-5	357	292	4.7	4.7	3.3	1.7	7.7	4.3	8.0	1.9
W 1568-5	390	353	4.7	4.7	3.7	1.7	8.3	5.0	9.0	2.5
W 1569-2	406	378	5.2	4.5	5.8	1.0	8.3	5.0	8.7	2.2
W 1647-1	630	569	5.0	4.7	5.7	5.0	7.7	5.0	7.3	1.9
W 1742-1	412	359	4.7	4.7	4.0	1.7	8.7	5.0	9.0	2.2
W 1782-8	512	427	4.8	4.5	2.7	6.0	8.0	5.0	8.7	2.0
W 1806-2	442	388	4.3	4.2	4.3	1.7	9.0	4.7	9.0	2.2
W 1811-2	435	371	5.7	5.2	6.0	1.0	8.0	5.0	9.0	2.0
W 1816-13	503	251	5.2	4.7	5.0	4.3	7.3	4.3	7.2	1.7
W 1876-1r	356	312	5.2	5.3	4.0	9.0	9.0	5.0	8.3	2.5
W 1879-1r	396	351	4.8	5.0	2.8	7.0	9.0	5.0	9.0	2.7
W 1934-6	400	318	5.0	4.8	2.8	1.0	9.0	4.3	9.0	2.2
W 1935-3	456	396	5.5	4.3	6.3	3.7	7.3	5.0	9.0	2.0
W 1936-8	403	361	5.0	3.7	2.3	1.7	8.7	4.7	8.3	2.0
W 1938-6	423	356	5.2	4.5	4.2	4.0	7.0	5.0	8.3	1.7
W 1946-2	418	364	5.0	4.7	3.5	4.3	6.7	2.3	9.0	1.8
W 1946-3	411	372	5.5	4.3	5.2	1.7	8.0	5.0	9.0	2.3
W 2504-9	442	387	5.8	5.0	6.7	4.3	7.3	5.0	7.3	2.0
W 2507-2	514	411	5.3	4.3	6.0	5.0	7.7	4.0	8.5	1.4
Average	448	388	5.1	4.8	4.5		8.1		8.6	

Tot = Total yield, A's = A size (>1 7/8" tubers) yield; VMt: Vine maturity (1=early, 9=late); Vig: Vine vigor (1=weak, 9=vigorous); EBt: Early blight (1=very attacked, 9=no attack); TbS: Tuber shape (1=round, 5=oval, 9=long); TbU: Tuber shape uniformity (9=very uniform); Flt = tuber flatness (1=very flat, 3=flat, 5=round); Scb: Scab (1=very attacked, 9=no attack); Pref: Preference (1=undesirable tubers, 2=acceptable tubers, 3=good tuber traits, 4=very good tuber traits).

Wisconsin Table 8. Advanced Selection Trial 2, Hancock, 1998 (118 days).

Cultivar	SpGv	Chip Color					
		Rev		3mD		3mR	
		-----		-----		-----	
		Vis.	L	Vis.	L	Vis.	L
Atlantic	75	3.4	56.8	9.9	29.7	8.7	30.3
Goldrush	58	7.0	42.9	9.9	25.3	9.9	26.5
RNorkotah	57	5.9	52.2	9.9	27.1	9.9	28.7
RBurbank	70	5.7	50.4	9.9	23.7	9.9	29.6
Snowden	72	2.9	61.7	9.9	28.8	7.7	34.6
Superior	65	4.3	53.6	9.9	28.0	9.7	26.7
W 1149	72	3.3	59.1	9.6	31.2	8.9	30.6
W 1290	86	2.5	37.1	8.1	37.1	6.5	41.2
W 1348rus	73	5.5	48.7	9.9	26.1	9.9	27.5
W 1355-1	72	2.6	62.0	9.1	35.0	6.9	38.9
W 1526-1	78	3.0	59.1	9.9	31.8	8.9	28.4
W 1566-5	62	2.6	64.9	8.6	37.9	7.3	35.8
W 1568-5	71	2.9	63.6	8.3	35.7	8.6	33.0
W 1569-2	79	3.7	58.1	9.9	28.2	9.2	29.8
W 1647-1	77	3.6	57.3	9.9	28.6	9.1	28.5
W 1742-1	69	3.5	55.6	9.9	24.3	8.6	30.2
W 1782-8	71	4.5	54.6	9.9	26.0	9.9	26.2
W 1806-2	81	3.1	57.9	9.7	30.8	8.8	33.2
W 1811-2	76	3.1	60.7	9.9	31.1	8.1	33.4
W 1816-13	73	3.5	58.6	9.9	30.4	9.3	28.4
W 1876-1rus	50	4.9	52.2	9.9	25.1	9.9	25.2
W 1879-1rus	62	6.7	47.4	9.9	27.7	9.9	29.4
W 1934-6	76	3.4	60.3	9.9	30.2	7.0	39.8
W 1935-3	67	3.0	59.8	9.4	29.6	7.9	38.0
W 1936-8	82	3.2	62.6	9.3	33.0	7.8	37.2
W 1938-6	78	3.0	62.2	8.9	34.0	8.3	33.7
W 1946-2	69	3.2	55.4	9.8	29.0	7.9	36.3
W 1946-3	64	3.1	61.2	9.3	32.9	9.4	29.7
W 2504-9	94	2.5	64.7	8.1	40.4	4.7	49.6
W 2507-2	81	3.4	56.8	8.9	27.1	8.0	34.8
Average	72	3.8	57.5	9.6	30.6	8.6	32.5

SpGv: Specific Gravity -1 x 1000; Chip Color: Vis, visual scores in CPII scale (1=light, 10=dark); L = lightness readings with HunterLab Colorquest 45/0. Rev = Reversion, 3m = 3 month storage at 40°F (D=direct, R = reconditioned 14 days at 65°F).

Wisconsin Table 9. North Central Regional Trial, Hancock, 1998 (118 days).

Cultivar	Cwt/A		Vines			Chip Col			Observations
	Tot	A's	VMt	Vig	EBt	SpG	3mD	3mR	
Atlantic	423	379	5.4	5.4	4.5	80	9.5	8.5	green
Snowden	330	297	5.1	5.6	5.4	79	10.0	6.5	green, Rhiz.
Norchip	394	356	4.1	5.3	3.4	68	9.9	9.7	many culls
R.Pontiac	416	383	5.5	6.1	4.5	53	10.0	10.0	pale, sprouts
DRNorland	450	421	1.0	1.3	1.0	54	10.0	10.0	buck skin
RNorkotah	449	421	3.0	3.0	2.1	61	10.0	9.3	some culls
R.Burbank	463	413	5.3	5.1	5.3	72	10.0	9.3	knobby, Rhiz.
MN16478r	400	369	4.9	5.5	4.3	74	10.0	9.8	too oval
MN16966r	441	401	5.5	5.8	5.4	75	9.8	10.0	white
MN17572R	437	367	4.0	3.5	2.5	50	10.0	10.0	pale color
MN17922R	453	426	4.9	4.5	4.4	58	10.0	10.0	skinning
MSA091-1	438	374	5.0	4.8	5.3	78	9.7	8.5	lenticels, Rhiz.
MSB073-2	482	441	5.4	5.3	5.6	80	10.0	10.0	small
MSE192-8r	481	428	5.0	4.6	3.8	63	10.0	10.0	narrow, skinning
MSE230-6	501	427	5.1	4.4	3.3	74	10.0	9.7	oval
ND2470-27	415	351	5.0	5.1	4.1	68	8.8	8.4	lenticels
ND2676-10	416	383	4.0	3.5	2.1	65	9.0	7.9	heat sprouts
ND4093-4r	401	343	2.0	2.0	1.3	64	10.0	9.3	medium dark
ND5084-3R	391	349	5.6	5.4	4.8	51	10.0	10.0	very pale
W1151rus	441	395	5.1	4.8	4.6	58	10.0	9.7	lenticels
W1313	491	437	5.5	5.4	5.0	85	7.4	7.4	Rhizoctonia
W1348rus	431	372	5.6	6.4	5.5	71	10.0	8.1	bottle neck
W1355-1	440	376	5.1	4.9	5.4	76	9.0	5.2	small
FV8957-10	403	375	4.0	4.1	1.8	64	10.0	10.0	smooth, nice
WIS75-30	483	418	5.1	4.9	5.4	78	9.1	7.7	little rough
Average	435	388	4.7	4.6	4.0	68	9.7	9.0	

Tot = Total yield, A's = A size (>1 7/8" tubers) yield; VMt: Vine maturity (1=early, 9=late); Vig: Vine vigor (1=weak, 9=vigorous); EBt: Early blight (1=very attacked, 9=no attack); SpG: (Specific Gravity -1) x 1000. Chip color: 3mD and 3mR = after 3 month storage at 40°F, processed directly (D) or with reconditioning (R), respectively; visual score (CPII scale: 1=light, 10=dark).

Wisconsin Table 10. North Central Regional Trial, Hancock, 1998 (118 days).

Cultivar	External Defects %					Internal Defects %					
	Gck	Ofs	SGn	Rot	Free	HH	IBS	VD	Norm	Scb	Rk
Atlantic	2	2	1	0	95	7	4	2	77	12	
Snowden	1	7	3	0	89	1	3	7	89	8	
Norchip	1	17	0	0	82	0	0	11	89	0	
R. Pontiac	0	1	7	1	91	1	0	18	81	45	
DRNorland	1	1	0	0	98	2	0	0	88	7	
RNorkotah	3	2	1	0	94	2	0	0	98	6	4
R. Burbank	2	10	2	0	86	1	1	9	89	2	
MN16478	0	1	1	0	98	0	0	29	79	4	
MN16966	0	3	2	0	95	0	0	8	92	19	
MN17572R	0	2	0	0	98	0	0	0	100	6	
MN17922R	2	3	2	0	93	0	0	14	86	1	
MSA091-1	1	3	2	0	94	2	0	20	78	0	
MSB073-2	0	1	3	0	96	1	1	7	92	2	
MSE192-8	0	10	1	0	89	0	0	3	97	0	
MSE230-6	0	8	1	0	91	1	0	0	99	1	
ND2470-27	0	3	2	0	95	1	0	9	90	10	
ND2676-10	0	2	2	0	96	8	0	16	76	1	1
ND4093-4	1	0	2	0	97	0	0	0	100	0	2
ND5084-3R	0	0	4	0	96	1	0	11	88	10	
W1151rus	0	2	1	0	97	0	0	16	84	12	5
W1313	0	0	0	0	100	0	3	10	87	22	3
W1348rus	0	0	6	0	94	1	0	1	98	0	
W1355-1	0	1	2	0	97	0	0	0	100	3	
FV8957-10	1	2	0	0	97	3	0	3	94	19	
WIS 75-30	0	0	2	0	98	0	0	1	99	2	
Average	1	3	2	0	94	1	1	10	88	9	

Gck: Tuber growth cracks (1=very cracked, 9=no cracks); Ofs: Off-shaped tubers; SGn: Sun green; Rot: Tuber rot; Free: Tubers free of external defects; HH=Hollow heart; VD=Vascular discoloration; IBS=Internal Brown Spot; Norm: Normal tubers (no internal defects); Scb: Scab (9=no attack); Rk: Rank - the first 5 for general merits.

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